VOLUME XXXI NUMBER TWO

THE NATIONAL GEOGRAPHIC MAGAZINE

FEBRUARY, 1917

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Yes, a Monopoly

IN HUDSON SUPER-SIX

But Note How We Employ It

It is true, as some say, that the Super-Six motor constitutes a Hudson monopoly. We control it by basic patents. One must buy a Hudson to get it. But note how far the Super-Six undersells many cars which it out-performs.

We must expect that every possible argument will be used against the Super-Six.

The arguments used a year ago have all been disproved and abandoned. Over 28,000 Super-Six owners have proved every suspicion baseless.

Now some say, "We also have an improved Six." Some argue Eights and Twelves. And some reflect on the Super-Six monopoly.

Mark the Hudson Value

But remember that Hudson has won by performance the pinnacle place in Motordom.

The Super-Six motor has added 80 per cent to the car's efficiency.

It has proved an endurance which is yet beyond measure—probably a doubled endurance.

Against all other types, however costly, it has won all the worth-while stock-car records.

And a year has been spent to make this car, in every detail, worthy of its front-rank place.

Yet note now many rivals—all without the Super-Six motor—sell above the Hudson price. Every buyer of the Hudson Super-Six gets a value of performance which can't be matched.

Why Another Type?

Then why consider another type of motor in buying a high-grade car?

Not because of performance. The records of the Super-Six prove it supreme in that.

Not because of endurance. The Super-Six excelled—as high as 52 per cent—in the feats which prove that.

Not because of smoothness. The whole Super-Six supremacy comes through minimized vibration.

Not because of anything. If any other motor type were better, don't you know that Hudson would adopt it? Rival types are not controlled by patents.

The Friction Question

The only question is, What motor best reduces friction? For that is the aim of all.

It is motor friction that wastes power, that limits performance, and that causes wear.

Friction was the limitation of the old-type Six. Friction caused the trend toward Eights and Twelves. And the solution of this problem is what stopped that trend. The Super-Six invention, by reducing friction almost to nil, gave the crown to a new-type Six.

It isn't speed, or power, or hill-climbing ability which makes the Super-Six supreme. It is endurance, due to lack of friction. That is what won those records. If that is important, the Super-Six is important.

A New Gasoline Saver

The latest Hudsons have a new gasoline saver which adds greatly to their economy. They have bodies which show our final attainment in beauty, finish, and luxury.

To own a Hudson Super-Six means to rule the road. And this car, in any crowd, looks the monarch that it is.

Phaeton, 7-passenger	$1650	Limousine	$2925	Town Car	$2925
Cabriolet, 3-passenger	1950			Town Car Landaulet	3025
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HUDSON SUPER-SIX

Elude Winter's Grasp

On your trip to California by traveling through the sunny Southwest. The freedom of observation platform and open windows increases your enjoyment of the journey through the balmy climate of the

SUNSET ROUTE

New Orleans, San Antonio, Los Angeles, San Francisco

Oil-burning locomotives, no dust, no dirt, no cinders. Dining Car Service unexcelled. Passengers on this route may enjoy the thrilling motor trip over the

Apache Trail of Arizona

at slight additional cost. *Literature on request.*

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$1150 F. o. b. Racine
Mitchell Junior—a 40 h. p. Six
120-inch Wheelbase

Mitchell SIXES

$1460 F. o. b. Racine
7-Passenger—48 Horsepower
127-inch Wheelbase

Now An $1150 Model, Too

This year we bring out Mitchell Junior—a smaller Mitchell Six. But not too small. The wheelbase is 120 inches—the motor 40 horsepower. So all the advantages of Mitchell efficiency can now be had in two sizes of cars, at two prices.

More Extras

Both of the Mitchells embody hundreds of extras, paid for by factory savings. They give you at least 20 per cent extra value over other cars in their class. All because John W. Bate, the great efficiency expert, has cut our factory costs in two.

There are 31 extra features—things which other cars omit. On this year's output, these extras alone will cost us about $4,000,000.

Our new body plant means another big factory saving.

Out of this saving, we add 24 per cent to the cost of finish, upholstery and trimming.

And now, for the first time, we announce double strength in every important part. Our margins of safety—once 50 per cent—are increased to 100 per cent.

See the Results

We urge you to see the extra values our factory efficiency gives you.

They are numbered by the hundreds. They show the result of John W. Bate's methods, which cut our factory cost in two.

No other high-grade car offers anywhere near such value. You can easily prove that. And the fact is winning tens of thousands to this Bate-built car.

There is not a single Mitchell extra which you don't want in a car.

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Racine, Wis., U. S. A.

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Mitchell—a roomy, 7-passenger Six, with 127-inch wheelbase. A high-speed, economical, 48-horsepower motor. Disappearing extra seats and 31 extra features included.

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Mitchell Junior—a 5-passenger Six on similar lines with 120-inch wheelbase. A 40-horsepower motor—¼-inch smaller bore than larger Mitchell.

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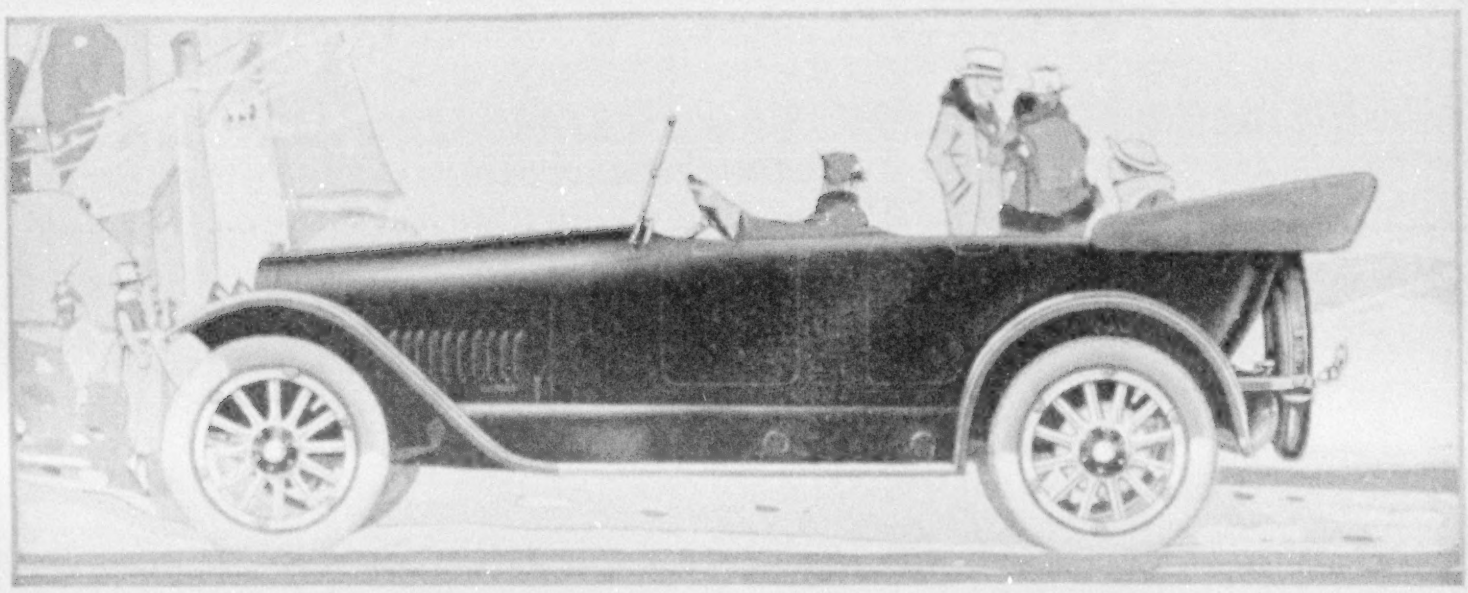
Also all styles of enclosed and convertible bodies. Also demountable tops.



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Taste Them They're Like

Bubbled Nuts

Puffed Wheat and Rice are whole grains puffed to bubbles. They are eight times normal size.

Before we explode them they are toasted in a fearful heat. This gives a nut-like taste.

So they seem like nut meats made airy and flaky, made flimsy and thin and crisp. If you ate them with your eyes shut you would never guess them grain foods.

They are Foods—Not Bonbons

But don't treat them like confections.

These are whole-grain foods. By Prof. Anderson's process, every food cell is exploded. So every atom of the whole grain feeds.

Don't be too sparing of these dainty morsels. Every food element is in them. And in this form those elements are all made available.

Don't confine them to breakfast. They are ideal foods for luncheons and suppers, floated in bowls of milk.

Between meals, when children get hungry, let them eat to their hearts' content. Let them eat the grains dry, or doused with melted butter.

Let Puffed Grains displace sweetmeats and confections—displace them with foods which are just as delightful. And which one can eat without any restrictions.

Not one child in ten ever gets enough of the minerals stored in whole wheat.

Puffed Wheat **Puffed Rice**
and Corn Puffs
Each 15c. Except in Far West

Here are three grains—wheat, rice, and corn—prepared in the perfect way. Every food cell is steam-exploded. Every granule is fitted to feed.

Each has a different flavor. Each can be served in a dozen ways. A supply of each gives you an endless variety. And all are fascinating, hygienic foods.

Puffed Rice excels in nut-like flavor. Corn Puffs excels as a dainty. And Puffed Wheat excels as a food.

Keep all three on hand.

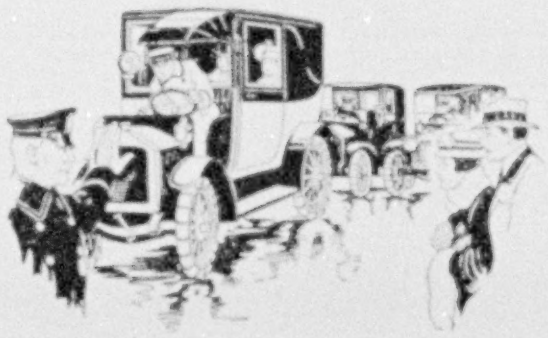
The Quaker Oats Company

Sole Makers

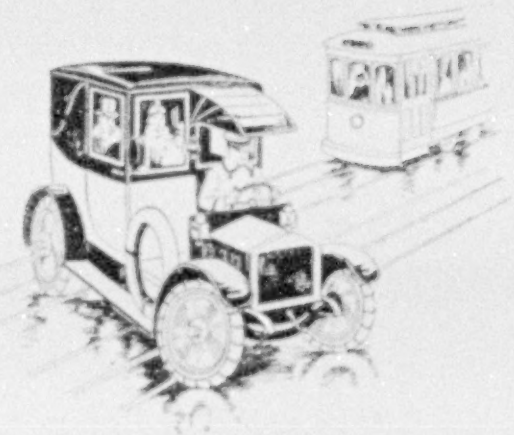
(1506)

"Mention the Geographic—It identifies you."

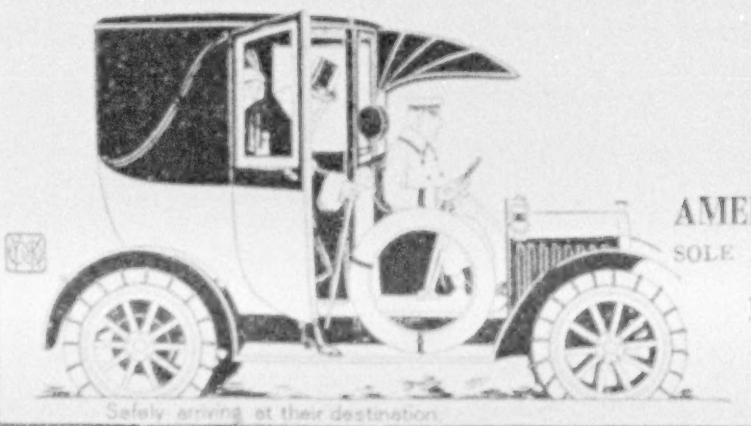
They start with a *steel-forged* safety guarantee on the wheels—Weed Chains.



A safe split-second stop



Safely over slippery car tracks.



Safely arriving at their destination.

In the Wake of WEED TIRE CHAINS

In any Big American City

WATCH—over there—that pulsing, hovering hawk of the streets—the taxi. A doorman's shrill whistle—the hawk swoops—a fare—the door slams—and they're off. Through a bewildering traffic web—crowding every inch. Suddenly the brakes grind and the chains grip without a slip for a safe split-second stop.

Again the slurring over slippery car tracks—whipping swiftly along on the sleek, wet asphalt—with ***Assurance*** behind the wheel because there is ***Insurance*** on the wheels—***Weed Tire Chains.***

When the public demanded "Safety First", the better taxicab companies immediately safeguarded their interests. Now—at the first indication of slippery going—you will find their cars carrying a steel-forged safety guarantee. They are equipped with Weed Tire Chains.

Taxi drivers have the reputation of being an efficient, hard-driving lot. Upon their reputation depends their job. They know the penalty of the menacing skid—the utter foolhardiness of gambling with chainless tires.

And if ***they*** won't gamble—***you*** can't afford to. The great joss Luck does not play favorites—consistently.

Weed Chains are recommended and sold by dealers everywhere for all sizes of tires with their hundred and more "fancy tread designs."

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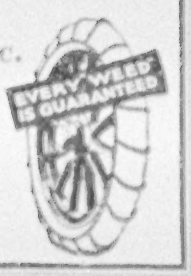
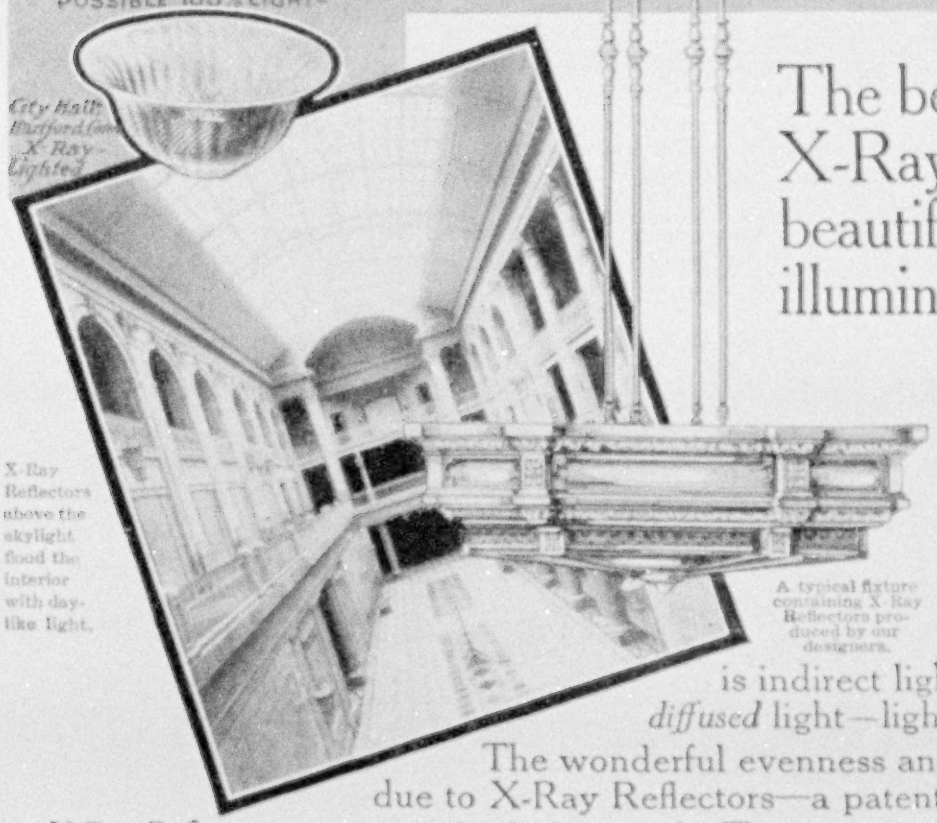


More than Mere Light
Engineered Lighting



X-Ray Reflectors above the skylight flood the interior with day-like light.

A typical fixture containing X-Ray Reflectors produced by our designers.

The best light for the eyes is X-Ray Lighting, combining beautiful fixtures and efficient illumination.

X-Ray Lighting from Concealed Sources

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The wonderful evenness and softness of X-Ray Lighting is due to X-Ray Reflectors—a patented idea.

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Name——
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State——

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So these devotees of the Six choose the Chandler, because through four years of intelligent, conscientious manufacturing effort, and without radical or experimental changes of design, the Chandler motor has been developed to a point approximating perfection.

Chandler Low Price is Important, Too

While with so many the question of price is of secondary consideration, still Chandler leads in price today quite as distinctly as it has always led.

In the face of advanced cost of all materials and labor, the Chandler price is but $100 higher than two years ago. And the car is finer than then. Not a feature has been cut out of it. Much has been added.

And other cars in the Chandler field have advanced as much as three hundred dollars the past year, either because of necessity or opportunity.

The Chandler Company has not been willing to take advantage of a situation which would have permitted price inflation.

And this year we shall probably build and sell more cars than any other manufacturer building a car of even similar quality.

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You who demand such a motor as the Chandler demand grace of body design, also, and richness of finish. Chandler offers you five beautiful types of body, each mounted on the one standard Chandler chassis.

Seven-Passenger Touring Car, $1395
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All prices f. o. b. Cleveland

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See inside for details

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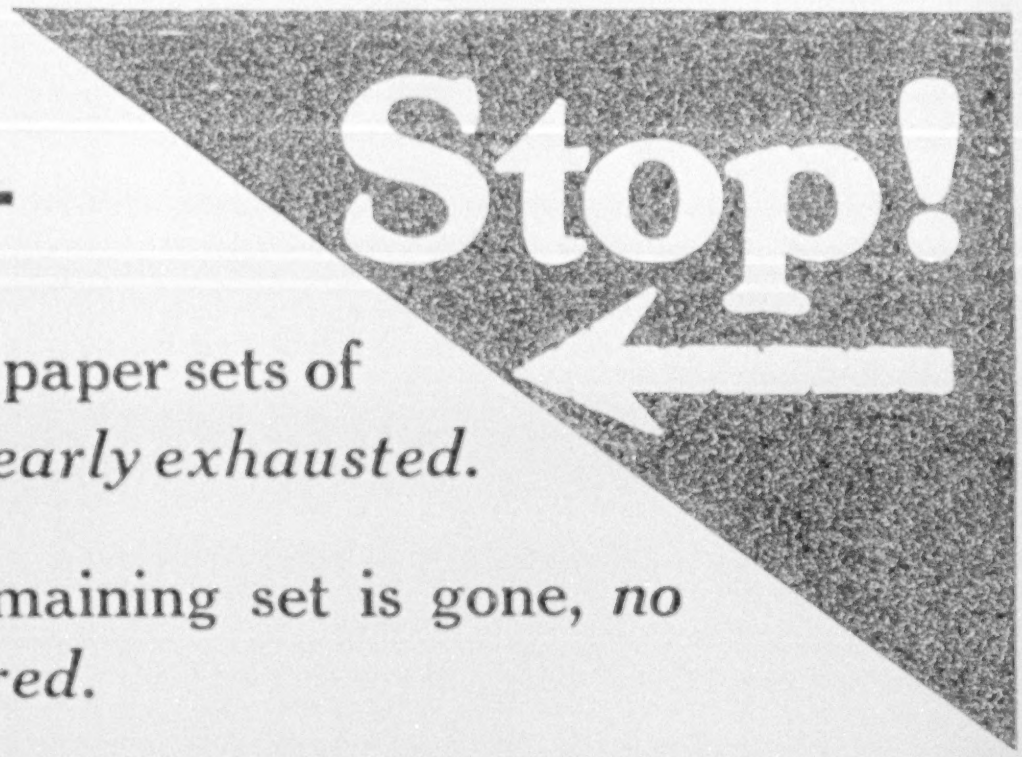

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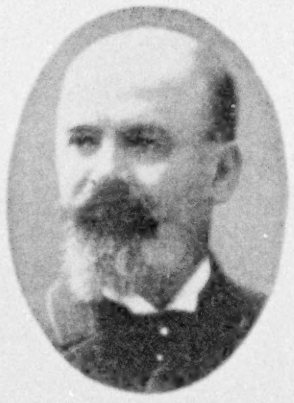
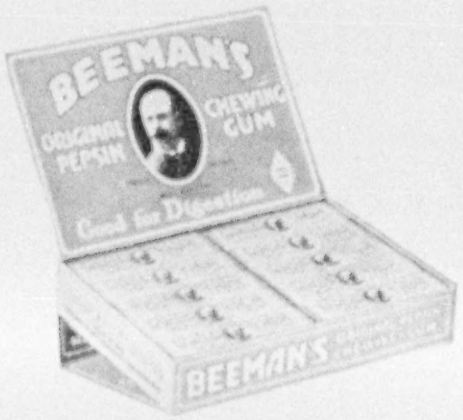


Many Illnesses can be traced to Indigestion

It is the lack of a sufficient quantity of the gastric juices of the mouth that causes many cases of indigestion.

Improperly digested food, as everyone knows, interferes seriously with the functions of all the vital organs, and frequently leads to serious illnesses.

The chewing of Beeman's Pepsin Gum, into which I have put pure chicle and pepsin in nicely balanced proportions, releases the gastric juices of the mouth which make up largely for what was lacking when the food causing the indigestion was eaten.



Doctor E. E. Beeman

CHICLE

AMERICAN CHICLE COMPANY

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT

JOHNS-MANVILLE ASBESTOS ROOFING

This fire-safe roof covers a building in the heart of a great city, exposed to man's most destructive agents—smoke, soot, and corrosive fumes. But it would serve just as well, and just as long, up in the frozen North or down on the sun-baked plains of Texas—it's made from J-M Asbestos.

Fire-safe because based on an imperishable mineral, and for that same reason weather-proofed, too, and good for years of service with least upkeep cost, these J-M Asbestos Roofings are guaranteed by Mother Earth herself:

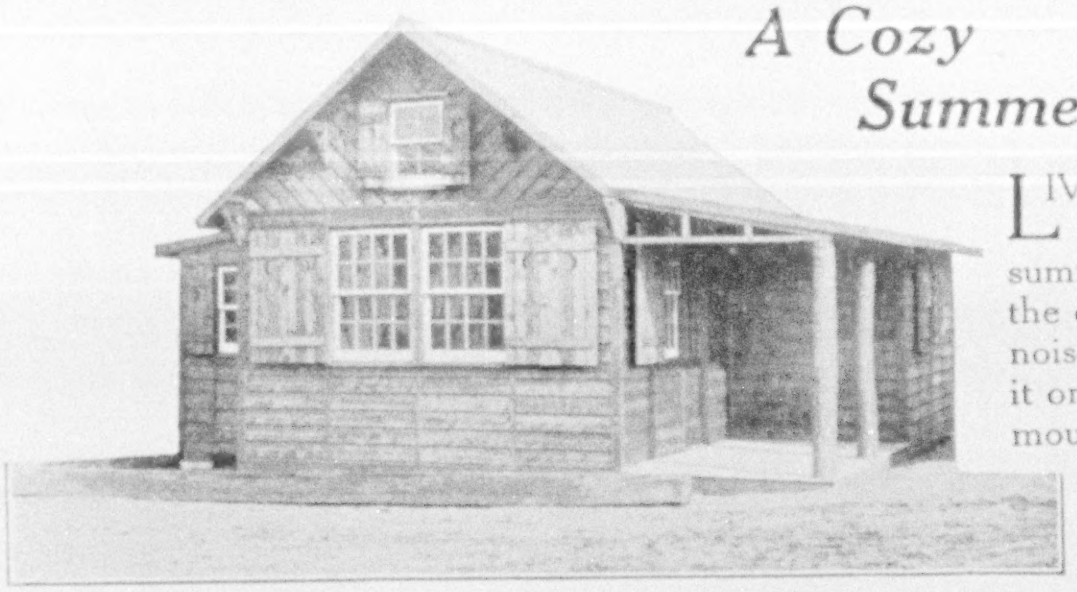
For flat roofs, J-M Asbestos Built-Up Roofing; for sloping roofs, J-M Asbestos Ready Roofing; for skeleton construction, J-M Corrugated Asbestos Roofing; for residences, J-M Transite Asbestos Shingles. And through our exclusive system of registration, each J-M Roof is backed by

J-M Roofing Responsibility
—our voluntary obligation to secure for you the full service promised. Ask any J-M Branch for complete details.

J-M Asbestos Roofings are examined, approved, and labeled by the Underwriters' Laboratories, Inc., under the direction of the National Board of Fire Underwriters.

H. W. JOHNS-MANVILLE CO.
New York City
Branches in 55 Large Cities

A Cozy Summer Camp



LIVE in a house like this next summer, far from the city's dust and noise. You can have it on the shore of a mountain lake, on the banks of your favorite trout stream.

BUILT by the Bossert Logical, Permanent Method of Construction, it is sturdier than any other type of frame construction, and yet it can be unassembled and put up again any number of times without damage or deterioration. This house is not painted, but stained a beautiful brown color with creosote, which not only preserves the wood, but brings out beautifully the natural grain.

It contains three bed-rooms, a 12x15 living room, and a 6x9 kitchen in extension.

Economies in the Bossert method of construction enable us to offer this camp complete at Five Hundred Dollars f. o. b. Brooklyn.

Send 12 cents today for catalog showing details of Bossert construction.

LOUIS BOSSERT & SONS, INC., 1313 Grand St., Brooklyn, N. Y.

Burpee's Seeds Grow

Burpee's Sweet Peas

For 25c we will mail our regular 10-cent packet (40 to 50 seeds) each of CHERUB, rich cream, edged bright rose; KING WHITE, the finest pure white; MARGARET ATLEE, best cream pink; ROSABELLE, a large deep rose; WEDGEWOOD, a lovely light blue. Also one large packet (90 to 100 seeds) of the BURPEE BLEND OF SUPERB SPENCERS FOR 1917.

Burpee's Annual for 1917

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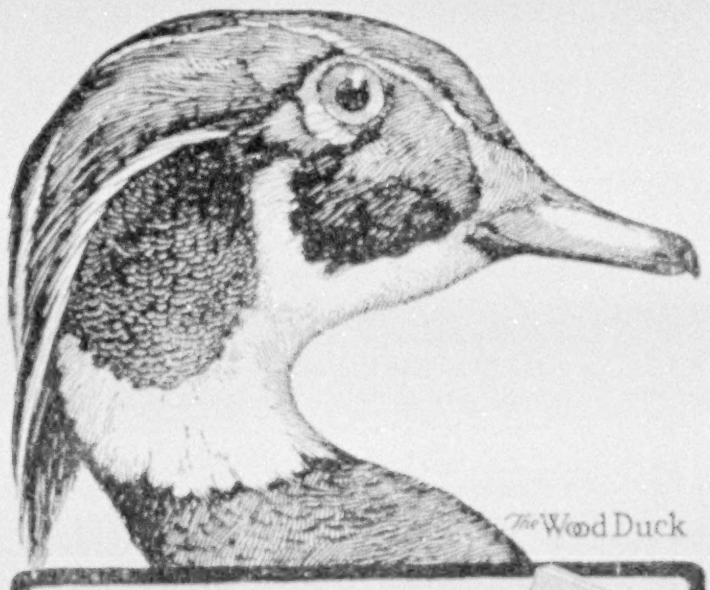

The Wood Duck

Become a Game Farmer

Write for these two books which tell all about this interesting and profitable work. "Game Farming for Profit and Pleasure," is sent free on request. It treats of the subject as a whole; describes the many game birds, tells of their food and habits, etc. "American Pheasant Breeding and Shooting," is sent on receipt of 10c in stamps. It is a complete manual on the subject.

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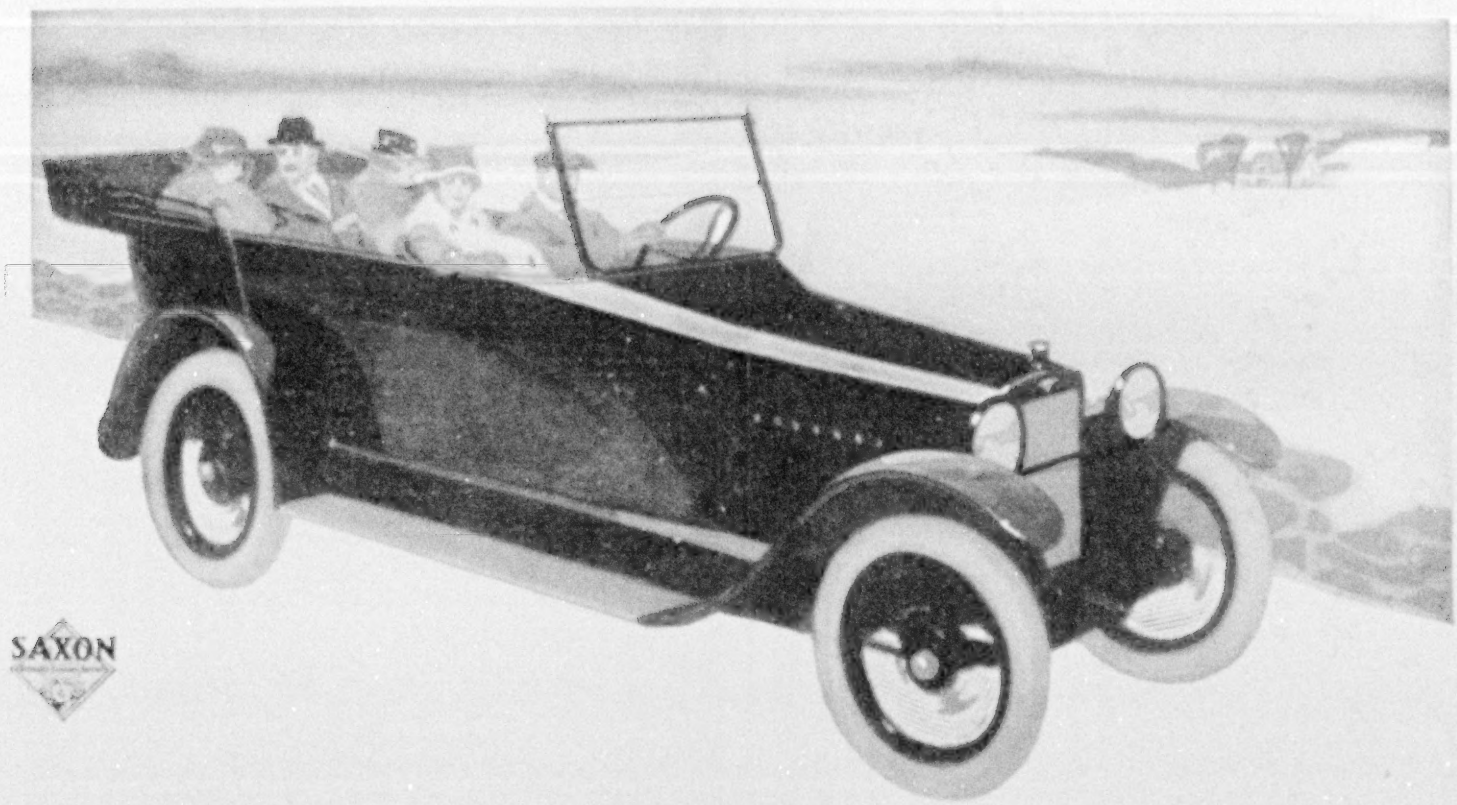

A Car Whose Quality Lifts It Above the Level of Its Price

Though priced at less than $1000, Saxon "Six" has forced—actually compelled—people to think of it in the terms of costly cars.

No other car we know of has ever accomplished this feat.

Can **you** think of any car in any other price class whose superiority is as distinct and pronounced as that of Saxon "Six," among cars costing less than $1200?

The answer, of course, is in the motor—the famous Saxon "Six" high-speed motor.

Its performance today is probably as nearly perfect as has ever been attained.

Consider, if you will, a certain car of "less-than-six cylinders" of similar price and good reputation.

At a speed of twenty miles per hour this "less-than-six" under test developed 1,512.73 power impulses per minute.

Saxon "Six" showed 2,993,-925 impulses per minute.

It is quickly apparent that the "less-than-six" motor leaves much to be desired.

For the less the number of impulses per minute the less smooth is the power-flow and the greater is the vibration.

And vibration induces friction, which is, as of course you know, the fiercest foe a motor car has to face.

Now you will see just how much advantage accrues from the 98% smoother power-flow of Saxon "Six."

This well-known car of less-than-six cylinders, previously mentioned, in repeated trials required 30 seconds to reach a 45 miles per hour speed from a stock-still stand.

Under the same conditions Saxon "Six" time and again duplicated this feat in 23 seconds.

This shows 22% faster pick-up in favor of Saxon "Six."

This instance pictures with fairness, we believe, the inherent superiority of Saxon "Six" over any other at less than $1200.

Saxon "Six" is $865; "Six" Sedan, $1250; "Four" Roadster, $495, f. o. b. Detroit. Canadian prices: "Six" Touring Car, $1175; "Six" Sedan, $1675; "Four" Roadster, $665. Prices of special export models—"Six," $915; "Four," $495. All prices are f. o. b. Detroit. (799)

SAXON "SIX"

A BIG TOURING CAR FOR FIVE PEOPLE

Saxon Motor Car Corporation, Detroit

"Mention the Geographic—It identifies you."

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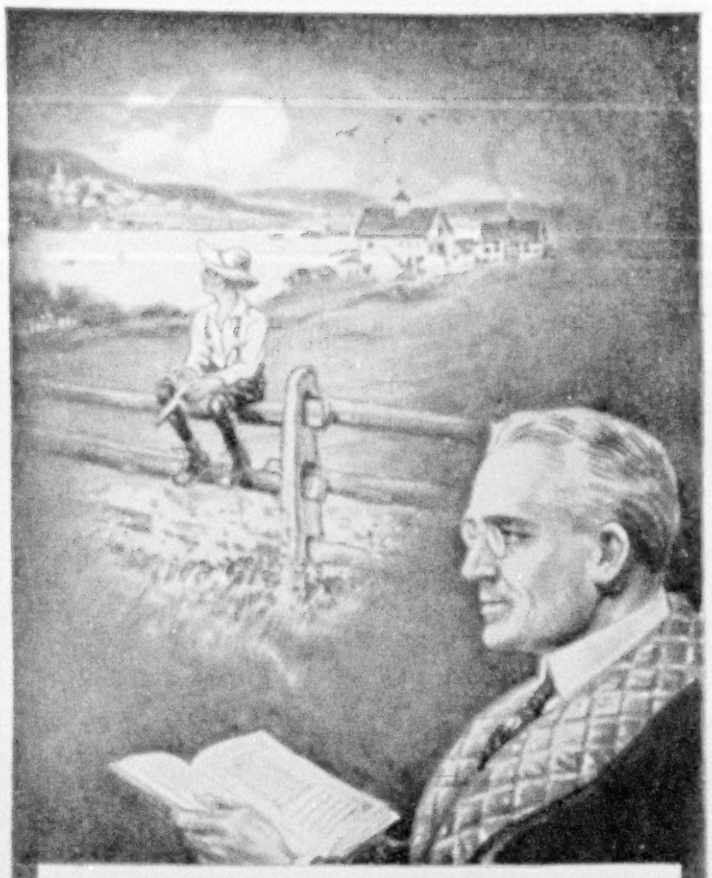

Are Your Eyes
as good as your memory?

Sometimes you look up from the Present into the Past, with all its memories. It is easy to do that.

But, here in the Present, are you able—
to look up from near objects and,
without changing or removing
glasses, see distant objects clearly?

KRYPTOK GLASSES
THE INVISIBLE BIFOCALS

Do enable you to see both near and distant objects as clearly and distinctly as with the eyesight of youth.

KRYPTOK Glasses end the annoyance of removing your reading glasses every time you look at objects more than a few feet away. They free you from fussing with two pairs.

KRYPTOKS (*pronounced Crip-tocks*) combine near and far vision in one crystal-clear lens—free from line, seam, or hump. They cannot be distinguished from single vision glasses.

Ask your oculist, optometrist, or optician about KRYPTOK Glasses.

Write for Booklet, "Eyesight Efficiency"

When writing, please give (if possible) name of your oculist, optometrist, or optician.

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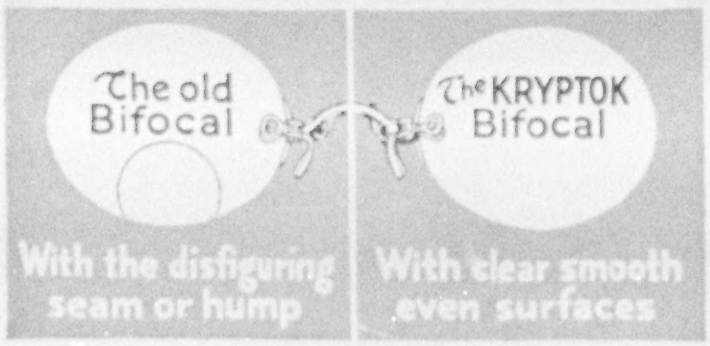
1056 Old South Building, Boston, Mass.



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secured by property in high cultivation in a section which has never known a crop failure. Conservative valuation of security over twice entire issue and net income largely in excess of all requirements.

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Our catalog shows you the great variety of purposes that Hodgson Portable Houses are made for.

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Municipals are the only securities, besides Government bonds, accepted by the United States Government to secure Postal Savings Deposits.

Confidence of our clients in us and the *Service* we give them, have created a most extensive business and enviable reputation for the William R. Compton Company. We shall be pleased to serve you.

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Complete safety of principal.
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NOT the least of the pleasures of a hard game is the bath that follows it. For it is just after the final whistle, when you realize for the first time how warm you are and how your skin is chafing, that the cooling, soothing, refreshing qualities of Ivory Soap are most appreciated.

The mild, smooth, copious Ivory lather feels grateful to the sweating skin and tired muscles. Just a few moments' stand under the rushing water removes every particle of soap and dirt. A brisk rub-down leaves the body aglow with health, and muscles and nerves in perfect trim.

It is this ability to cleanse thoroughly without irritation to the skin that makes Ivory Soap so popular with all athletes. In it quality and purity combine to produce cleanliness pleasantly and perfectly under every conceivable condition.

IVORY SOAP. . .

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99 44/100 % PURE

VOL. XXXI, No. 2 WASHINGTON FEBRUARY, 1917

THE NATIONAL GEOGRAPHIC MAGAZINE

OUR FOREIGN-BORN CITIZENS

ALTHOUGH the immigrants who have flocked to our shores since 1776 have mingled their blood with pre-Revolution strains until the American of unadulterated colonial ancestry is the exception and not the rule; although a great political party was formed and the presidential campaign of 1856 was fought with the immigration question as practically the paramount issue; although the coming of the Irish and of the eastern European each in turn stirred the nation, there never has been a time when the subject of our foreign-born population occupied such a deep place in the minds of the people as it does today.

Should we have departed from our time-honored custom of making America a homeland for whoever loves freedom for himself and craves liberty for his children, whether he be literate or illiterate? Would our polyglot population be a menace in war time, or would it, as we have proudly thought in the past, be fused into one liberty-loving, flag-defending race? And when the war is over and the world escapes from the horrible nightmare of blood and carnage and hate, will the consequent burdens drive hordes of people to America, as did the potato famine in Ireland, the social and political unrest in Germany in the decade preceding our Civil War, and other economic hardships in continental countries?

THE MOST FREQUENTLY VETOED MEASURE IN AMERICAN HISTORY

Never in the history of the American people has a measure been passed by Congress as often and vetoed by the President as many times as the immigration bill recently enacted into law. Three Presidents of the United States have felt so keenly that the founders of the government and their successors were right in holding that the lack of opportunity to learn to read and write should not bar an alien from freedom's shores, that they have overridden the will of four Congresses and have interposed their veto between the congressional purpose and the unlettered immigrant's desire.

But Congress was strong enough at last to override the presidential veto, and so the immigration doctrines of a century and a quarter are changed and the practices of generations are to be made over. Hereafter no one above the age of 16 who cannot read and write may enter.

The effect of the literacy test applied to the immigration of the future may be shown by a few figures. More than one-fourth of all the immigrants admitted to the United States in the past two decades who were over 14 could neither read nor write. Out of 8,398,000 admitted in the ten years ending with 1910, 2,238,000 were illiterate. And yet so rapidly does illiteracy melt away that, adding to this number all the illiterates here before these came, there were only 1,600,000 illiterate foreigners in the United States when the census of 1910 was taken.

Under a literacy test we will turn back one-fourth of the Armenians, two-fifths of the Serbians, Bulgarians, and Monte-

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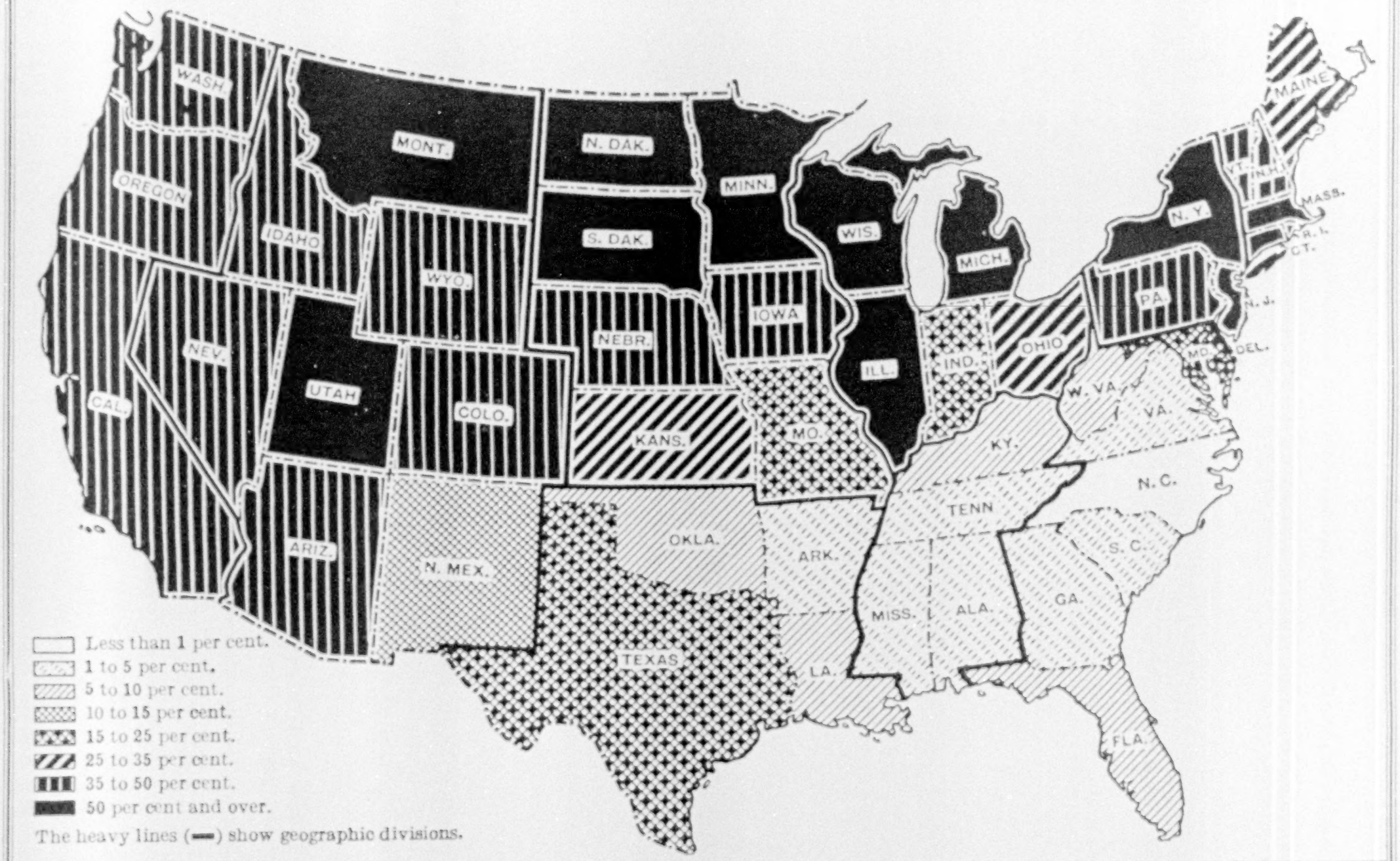

MAP SHOWING THE FOREIGN STOCK IN THE POPULATION OF THE UNITED STATES—BY FOREIGN STOCK IS MEANT FOREIGN BORN AND CHILDREN OF A FOREIGN-BORN FATHER OR MOTHER

The States in black have more people who are either immigrants or the sons and daughters of immigrant parents than they have of native stock. The immigrants of the United States and their children would populate to its present density all of the United States west of the Mississippi, with Alabama and Mississippi added.

Photograph from Frederic C. Howe

SCOTCH CHILDREN

Taunted with the fact that in England oats were fed to horses and in Scotland to men, a famous Scot replied that England was famous for its horses and Scotland for its men. America knows how much it is indebted to Scotland and the Scotch-Irish. Nearly half of our Presidents have been either Scotch or Scotch-Irish.

negrins, more than a fourth of the Jews and Greeks, more than half of the South Italians, more than a third of the Poles and Russians, and a fourth of the Slovaks.

Who can estimate our debt to immigration? Thirty-three million people have made the long voyage from alien shores to our own since it was proclaimed that all men are born free and equal, and liberty's eternal fire was kindled first on American soil! It is as if half the German Empire should embark for America, or all of England except the county of

A RUSSIAN HEBREW VEGETARIAN IMMIGRANT AT ELLIS ISLAND: NEW YORK CITY IN THE BACKGROUND

In normal times Ellis Island might be called the World Congress of Costumes. Everything but the habiliments of Eden seems to pass muster there.

Photograph from Frederic C. Howe

FOUR LITTLE DUTCH KIDDIES JUST ARRIVED

Generations of careful living such as is always necessary in a country of narrow boundaries and expanding population has developed in the Dutch a frugality and a contentment with simple pleasures that cannot be excelled.

Kent. It is as if all of the population of all of the States of the United States west of the Mississippi, plus that of Alabama, should have come bodily to America.

History records no similar movement of population which in rapidity or volume can equal this. Compared to it, the hordes that invaded Europe from Asia, great and enormous as they were, were insignificant.

Of the 33,000,000 who have come more than 14,000,000 still live among us, and their children and children's children are now in good truth bone of our bone and blood of our blood.

Not long ago America crossed the hun-

Photograph from Frederic C. Howe

TWO DUTCH FAMILIES—IMMIGRANTS THROUGH ELLIS ISLAND: IN EACH CASE THE PARENTS AND CHILDREN NUMBER 13

dred-million line in the number of its citizens, and it is interesting to note the composition of that population.

To begin with, there are 11,000,000 colored people, including negroes, Indians, Chinese, etc. Then there are 14,500,000 people of foreign birth among us. In addition to these, there are 14,000,000 children of foreign-born fathers and mothers and 6,500,000 children of foreign-born fathers and native mothers, or *vice versa*. When all of these have been deducted from the 100,000,000, only 54,000,000 remain of full white native ancestry.

NOTABLE PEOPLE OF FOREIGN STOCK

Yet the 35,000,000 American people who are of foreign stock—that is, foreign born or the children of a foreign-born parent—include some of the most illustrious citizens of our Republic. Even the President of the United States himself has only one ancestor who was born in America, and the list is long and notable of statesmen, captains of industry, leaders of finance, inventors, makers of literature and progress, who have strains of blood not more than one generation on this side of the sea.

An examination of the statistics of American immigration shows that since the foundation of our government the United Kingdom of Great Britain and Ireland have contributed 8,400,000 of her people and Germany more than six million. Ireland, with more than four million; Great Britain, with a little less than four million, and Scandinavia, with something less than two million, have, together with Germany, contributed more than half of the total immigration to our shores since the beginning of the Revolutionary War.

When we take the German immigration of the United States between 1776 and 1890 and compare it with that from other countries, a somewhat startling result, and one usually unsuspected, is disclosed. The total arrivals of aliens in those 114 years aggregated 15,689,000, of whom more than 6,000,000 were British and Irish and 5,125,000 were Germans, which shows that one alien out of every three arriving in America during more than a century of our existence was a German. Only the United Kingdom shows a greater proportion.

Photograph from Frederic C. Howe

TYPICAL HEAD-DRESS OF ITALIAN WOMEN

Since 1890 the trend has been very different. With more than 17,000,000 immigrant arrivals since that date, only 1,023,000 have been Germans. If from this number a proper deduction is made for those who returned to their homeland and those who have died since their arrival, it will be seen that there are fewer than a million former subjects of the Kaiser in this country who have not been here more than twenty-six years. Of more than 8,000,000 people of German birth and immediate ancestry among us, less than 1,000,000 fail to have the background of birth or long residence in America behind them.

IRELAND'S GIFT TO AMERICA

It is interesting to note the other foreign elements that have entered into the make-up of American population since 1776. What a wealth of blood that wonderful little island, Ireland, has given us! More Irish people have crossed the seas to become part of us than have remained

A RUSSIAN VEGETARIAN

A BAVARIAN PEASANT

Photographs from Frederic C. Howe

behind. It is remarkable that so small an island—smaller, indeed, than the State of Maine—could in a century and a half send us enough people to duplicate the present population of eleven of our States having an aggregate area as large as the United Kingdom, France, Germany, and Austria-Hungary together.

Austria-Hungary stands next on the list of contributors to the immigrant stream that has flowed from Europe to America. Although Austro-Hungarians began to immigrate in considerable numbers only when the arrivals from western Europe had begun to fall off, sufficient have come from the dual monarchy to populate the State of Texas to its present density. Italy has sent us enough of her people to duplicate the population of Montana, Wyoming, Idaho, Oregon, Nevada, Utah, Colorado, Arizona, and New Mexico, while England's and Scotland's contribution, 3,889,000 in all, together with Ireland's 4,500,000, gives a total of 8,389,000, or plenty to populate all of the States lying west of Texas and the Dakotas. The Russians who have come to our shores number 3,419,000. They could

Photograph from Frederic C. Howe

CHILDREN FROM THE BALKAN STATES

"Such pretty dollies as they do have in America! 'Course I'll have my picture taken if you let me hold that sweet little dollie!"

replace one-half of the population of New England.

Although the people of foreign birth constitute only one-seventh of the country's population, they contribute nearly one-fourth (22 per cent) of the arm-bearing strength of the nation. At the last census many of the States had a greater number of foreign-born men of arm-bearing age than they had of native-ancestry citizens, among them Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Wisconsin, Minnesota, and North Dakota. Taking the States where those of foreign birth and their sons together constitute a major portion of the men between the ages of 18 and 44, it will be found that the list includes the above States and the following: New Hampshire, Pennsylvania, Michigan, South Dakota, Nebraska, Montana, Idaho, Arizona, Utah, Nevada,

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A NATTY LITTLE LADY FROM NORWAY

WALLACHIAN CHILDREN FROM AUSTRIA

Photographs by A. P. Sherman

Washington, and California—in all 20 States. We have considerably over 20,000,000 men of military age in the United States.

THE IMMIGRANT'S PREFERENCE FOR CITY LIFE

Another striking fact of our immigration situation is the unusual preference of the foreign born and their children for the cities. Of the 35,000,000 foreign-stock whites living in the United States, approximately 23,000,000 live in the cities. In only 14 of the 50 leading cities of the country do the whites of full native parentage constitute as much as half of the total population. Only one-fifth of the population of New York and Chicago is of native white ancestry. Less than a third of the populations of Boston, Cleveland, Pittsburgh, Detroit, Buffalo, San Francisco, Milwaukee, Newark, Minneapolis, Jersey City, Providence, St. Paul, Worcester, Scranton, Paterson, Fall River, Lowell, Cambridge, and Bridgeport are of native ancestry.

Conditions have played some curious pranks in the distribution of the immigrant population in the United States. More than two-thirds of the Germans live between the Hudson and the Mississippi and north of the Ohio. The same is true of the Austrians, the Belgians, the Hungarians, the Italians, the Dutch, the Russians, and the Welsh.

New York, Pennsylvania, and New Jersey have 47 per cent of the Austrians, 34 per cent of the English, 30 per cent of the Germans, 54 per cent of the Hungarians, 45 per cent of the Irish, 58 per cent of the Italians, 56 per cent of the Russians, 34 per cent of the Dutch, and 46 per cent of the Welsh in the United States.

NINETEEN-TWENTIETHS OF OUR FOREIGN BORN CAME FROM COUNTRIES AT WAR

An examination of the data at hand shows that nearly nineteen-twentieths of our foreign-born population come from the countries in Europe now at war. With such a surprising number of people among us who first beheld the light of day under flags now flying over Europe's battlefields, does it not speak well for our country's adopted children that there have been no more evidences of hyphenism than the past thirty months have disclosed?

Photograph from Frederic C. Howe

IN MATTERS OF COSTUME AMERICANIZATION OFTEN PROCEEDS ALL BUT TOO RAPIDLY

The war in Europe has largely closed the gates of that continent to the emigrant. But three short years ago Ellis Island, the greatest immigrant gateway in the world, was one of the busiest places on the face of the earth. The wheels of the great machine that carried the incoming alien through the doors of America turned fast and long. Morning, noon, and night, the men who manned

A TURKISH BANK GUARD

EVEN ALGERIA SENDS ITS QUOTA TO AMERICA

Photographs from Frederic C. Howe

this wonderful mechanism labored as seldom men have to work in order to keep the machine moving fast enough to take care of the vast flood of humanity presenting itself there for inspection and adoption.

Now all is different. Military necessity must be served, and hundreds of thousands, perhaps millions, of those who would have come to man our ever-expanding industries are now on the battlefields of Europe, some still surviving the awful avalanche of fire and steel, and others, alas, asleep in those last trenches where the unending truce of death has stilled the enmities of life! And so Ellis Island is a somewhat lonesome place today. The twelve hundred thousand who came in 1914 are followed by the three hundred thousand of 1916.

THE WAR'S RELATION TO IMMIGRATION

But what of the morrow of American immigration? Will the war, whose military necessities all but stopped the immigrant tide from Europe, be followed by a

Photograph by A. F. Sherman

IMMIGRANTS IN RAILWAY WAITING-ROOM: ELLIS ISLAND

Having passed muster with the doctor and the inspector at the nation's gate, it has swung open to these new arrivals, and now they are in free America, ready to journey unhindered to their respective destinations.

peace whose economic opportunities will have the same effect?

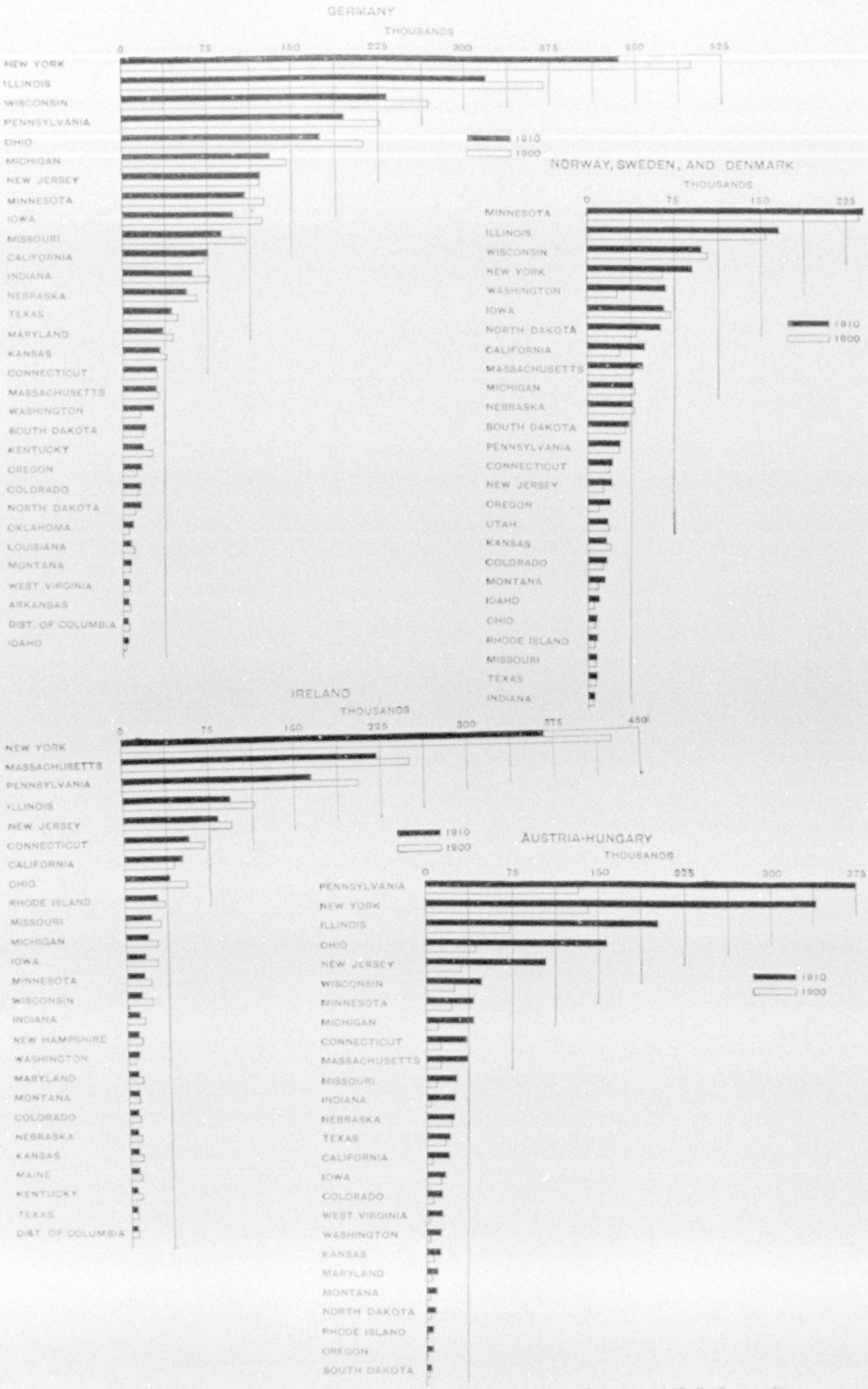
One searches the pages of history in vain for a satisfactory answer. The history of past wars throws no certain light upon it. After our own Civil War, the South, burdened with debts, wanted a million things. But empty pocketbooks and poor credit form a combination that has little buying power. And so the South, unable to solve its economic difficulties at once, had to sit by and see thousands of its people go into the North and West to start over again. The end of the Russo-Japanese War brought great hordes of Russians to our shores, economic necessity impelling them to leave their homelands.

The Franco-Prussian War, on the other hand, sent only a normal number of French people to America as one of its aftermaths, and all the people who left Europe following the Napoleonic wars were fewer in number than those coming here in a single three-months' period of our normal immigration history.

There are those who say that the reason the South could not rebuild after the Civil War was because it did not get the support of the Federal Government—a support which the governments of Europe will give their people. They point out that none of the warring nations, however much they may owe, have borrowed as near to the margin of their credit as many Latin-American countries, and that people who would not buy their war bonds will take their peace obligations readily. They point to the experience of Baltimore and San Francisco to show how new prosperity and fresh resources can arise out of the ashes of calamity.

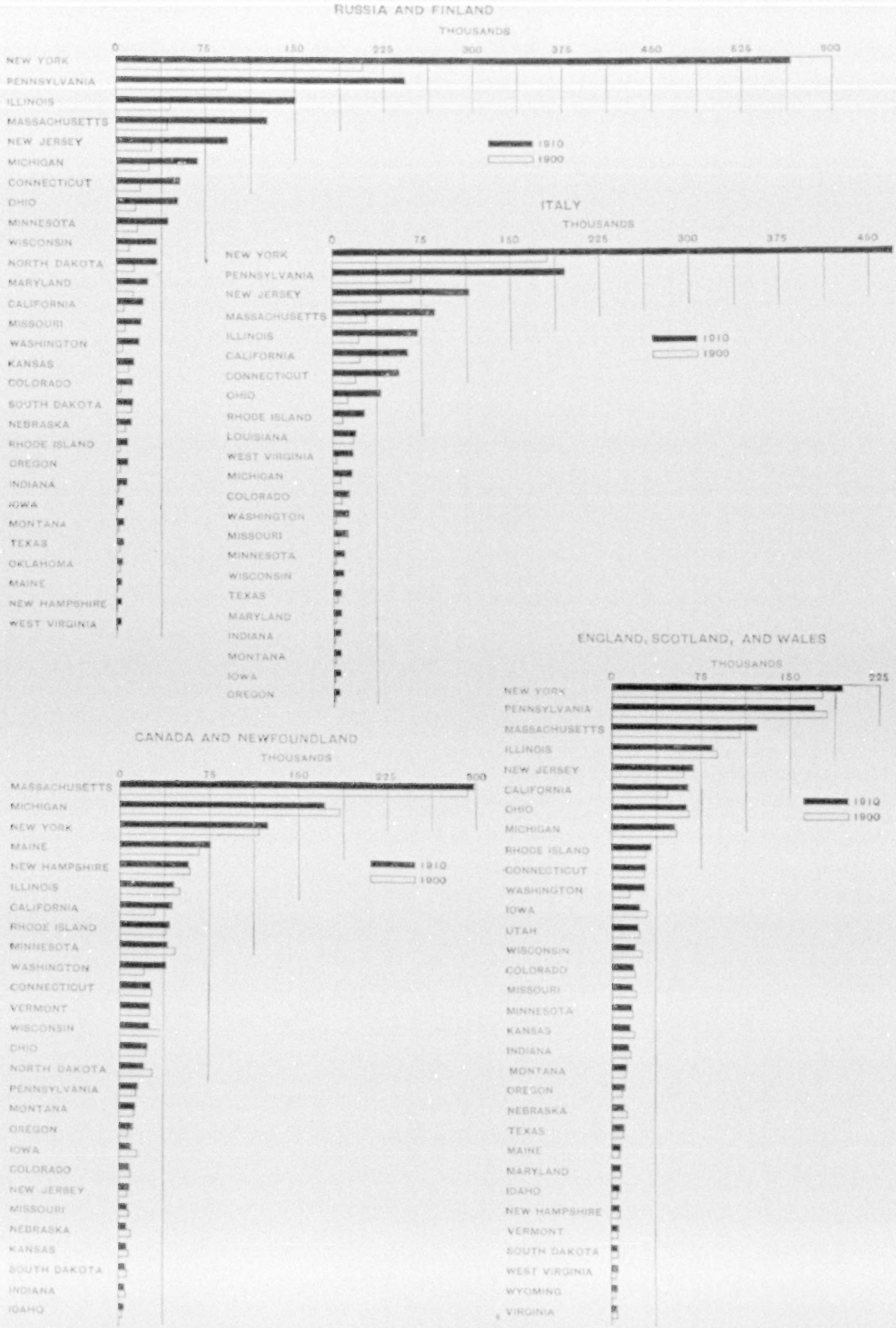
SIX PANAMA CANALS A YEAR INTEREST CHARGE

But the difference between an isolated city and practically a whole continent is too great for such an analogy to be sig-



Courtesy of U. S. Census Bureau

THIS ILLUSTRATION SHOWS WHERE OUR IMMIGRANTS FROM GERMANY, SCANDINAVIA, IRELAND, AND AUSTRIA-HUNGARY HAVE SETTLED



Courtesy of U. S. Census Bureau

THIS ILLUSTRATION SHOWS WHERE OUR IMMIGRANTS FROM RUSSIA, ITALY, CANADA, AND GREAT BRITAIN HAVE SETTLED

Photograph from Frederic C. Howe

A LAPLAND WOMAN

nificant. Furthermore, no State, no nation, no continent has ever before staggered under such an overwhelming debt. If the war were to end now, its financial obligations alone, to say nothing of the devastation, would reach a total of $60,000,000,000. Think of a continent, with much of the flower of its brains and brawn either dead or maimed, and vast areas of its productive territory in ruins, facing a debt whose interest charges alone annually will equal the cost of six Panama canals! And that continent one which, before the war, sent us a million of its people every year because living was hard at home!

Whoever has stood at the gate at Ellis Island and watched the human tide surge through, and whoever has traveled among the peasants of Europe must realize how narrow before the war was the margin between their total income and their necessary outgo. Against these things must be matched the efficiency that the war has forced upon the people and the nations and the spirit of self-sacrifice it has engendered.

America has always been a polyglot nation, although all tongues do finally melt into hers. It is said that twenty years after Hudson discovered Manhattan fourteen languages were spoken in New Amsterdam. The religious wars in the seventeenth and eighteenth centuries sent thousands and tens of thousands of French Huguenots, German Protestants, and English Puritans to our shores. One American-built vessel is said to have made 116 round trips between New York and Liverpool in nineteen years, during which time it brought 30,000 immigrants to America.

A MAN VALUED AT FIFTY DOLLARS

The first colonial charter granted by England for the purposes of new settlement was conditioned on homage and rent. This was the Virginia charter for the land extending from Cape Fear to Halifax, the rent of which was to be one-fifth of the net produce of gold, silver, and copper. The land aristocracy was promoted by the provision that a planter might add fifty additional acres of land for every person he would transport into Virginia at his own cost. When the Pilgrims were outfitting, each immigrant was rated at a capital of ten pounds. No divisions of profits was to be made for seven years.

In the early days the people who came were largely of the sturdy pioneer type. A great many of them could neither read nor write, while most of those who could were able to do so only in a limited way. The transpositions in many names in America came from the carelessness or inability of public officials in spelling men's names straight in deeds, wills, and other documents.

GOVERNOR BERKELEY OPPOSED THE PRINTING PRESS

In 1718 three hundred and nineteen Scotch-Irish empowered their agent to negotiate terms with the Governor of Massachusetts for their settlement in that colony. Ninety-six per cent of the whole number wrote their names out in full. It has been said that at that time in no other part of the British Empire could such a proportion of men miscellaneously selected have written their names. Twenty-six per cent of the German male immigrants above sixteen years of age who came to America in the first half of the eighteenth century made their marks.

Different communities took different views as to education in those early times. In Connecticut every town that did not keep school for at least three months in the year was liable to be fined. In Virginia, Governor Berkeley thanked God that there were no free schools, nor printing presses, and expressed the hope that they would not arrive during his century, since he believed that learning brought disobedience, heresy, and sects into the world, and printing developed them. At one time in Virginia, out of 12,455 male adults who signed deeds and depositions, 40 per cent made their marks.

Immigration to the United States was not large in the early history of the country. Europe did not look upon the young republic with any favor, and the people of that continent did not regard America as offering attraction for the ambitious home-seeker. Between 1776 and 1820, a period of 44 years, less than 250,000 immigrants are believed to have arrived in the United States — an average of fewer than 6,000 a year.

The students of immigration differentiate between the immigrants from northwestern Europe and those from southern and eastern Europe by calling them "old" and "new" respectively. The "old" immigrant arrived with his family and came with a desire to make America their home. Only sixteen out of every hundred of the "old" immigrants returned to Europe, and more than two-fifths of those who came were females. On the other hand, thirty-eight out of every hundred of the "new" immigrants return to their native lands, while only one-fourth of those who come are females. It will be seen from this that proportionately more than twice as many of the "new" immigrants return to Europe as of the "old," while the number of women among the "new" is vastly smaller.

LABOR'S DEBT TO IMMIGRATION

Northwestern Europe has given us 17,000,000 immigrants, where southern and eastern Europe have sent us 15,000,000.

The labor supply which immigrants have brought to the nation constitutes an incalculable debt. Seven out of every ten of those who work in our iron and steel industries are drawn from this class; seven out of ten of our bituminous coal miners belong to it. Three out of four of those who work in packing towns were born abroad, or are children of those who were born abroad; four out of five of those who make our silk goods, seven out of eight of those employed in our woolen mills, nine out of ten of those who refine our petroleum, and nineteen out of twenty of those who manufacture our sugar are immigrants or children of immigrants.

The story of Calumet, in the northern part of Michigan, shows how much of a monopoly the immigrant has in the mining industry in America. It is a city of 45,000, who live and work in the copper mines under Lake Superior. Twenty different races share in its population, and not even Babel heard more tongues. Sixteen nationalities are represented on its school-teaching force. In New York the foreigners colonize, as on the East Side; in Calumet it is the native population that colonizes, the American colony there being known as Houghton.

Americans sometimes are inclined to complain about the lowering of wage standards through the advent of the "new" immigrant. Where once the native citizen and the home-builder from northwestern Europe had to engage in ditch digging and in dirty and dangerous occupations, the coming of the "new" stream of humanity has released them from such task and has permitted them to take higher positions in the industrial world. The Irish, German, Welsh, and Scandinavian within our gates, along with the native American working-man, are now able to give their time almost wholly to work in the field of skilled labor, and as overseer for the "new" immigrant in the industrial centers. The latter has been the ladder on which his predecessor has climbed.

MOVING INTO BETTER QUARTERS

Go to New York or any other principal city, and you will find that the quarters that were once occupied by the Germans, the Irish, the English, and the Scandina-

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THE MELTING-POT IN OPERATION

Of the 14,500,000 people of foreign birth in the United States today, some 3,000,000 do not speak our language. The United States Bureau of Education of the Department of the Interior, which has accomplished wonders in coördinating the educational activities of the nation, has undertaken to establish night schools in every industrial center as one of the processes of Americanizing these people. Other nations frequently compel their nationals to learn the official language and place bans on alien tongues. But America is going about the task in kindlier spirit and its efforts are being appreciated. The picture shows the school of a big industrial concern in session; the teachers at the blackboards are foreigners who can talk in both their native and their adopted tongues.

Photograph from Frederic C. Howe

MONTENEGRINS IN THEIR NATIVE COSTUMES

Mountaineers by birth and environment, the people of Montenegro are a tall, upstanding, sinewy race. Physical perfection must be inherited, but education may be acquired, and the Montenegrin bequeaths the one and a desire for the other to his American-born posterity.

vians are now occupied by the Italians, the Slavs, and the immigrant Jew. Their coming has permitted the foreign born who came in earlier decades to command better positions and to live under better conditions than they otherwise could have done.

From whatever country the immigrant comes, he is, as a rule, above the average of the working classes in his community; for money is scarce in southern and eastern Europe, and the peasant who can accumulate enough to bring him to the United States must have some purpose in life, a fair share of ambition, and no little ability to practice self-denial. The great majority have come from the small villages in the rural districts.

That the alien's children are less illiterate than he is; that they commit less crime than he does, and have less tendency to insanity than he is shown by the statistics gathered by the United States Bureau of the Census and by the Immigration Commission of 1911.

Furthermore, these statistics prove that his grandchildren are about as free from illiteracy as the American child of na-

Photograph by Frederic C. Howe

CHILDREN OF ALL NATIONS ON ELLIS ISLAND ROOF GARDEN

Many of the poor little boys and girls who arrive at Ellis Island do not know how American kiddies play, but the roof-garden romps one may see every fair day show that they are apt at learning.

tive lineage, and even less disposed to insanity than the child whose ancestry may be traced to colonial times. In everything that goes to show good citizenship the grandchild of the immigrant stands the statistical test as well as the child of native parentage. How many immigrants we shall receive in the future no one can say. But, assuming that we have no immigration, and that the United States will grow as fast during the three centuries ahead of us as Europe grew from 1812 to 1912, we will have a population of nearly 500,000,000 in 2217, or approximately 166 to the square mile.

Agricultural students have declared that the soil of the United States has a sustaining power of 500 to the square mile. Assuming that one-third of the country is occupied by waste land, we have room on this basis for 900,000,000 people.

Photograph from Frederic C. Howe

NORWEGIAN CHILDREN IN PEASANT COSTUME

Of all the countries of the earth, only Ireland has contributed a greater proportion of her sons and daughters to the development of America than Norway. We now have one-third as many Norwegians and their children as the homeland itself.

Photograph from Frederic C. Howe

A FINNISH FAMILY

There are about six thousand Finns in the United States. Hardy, self-reliant, industrious, they make good citizens of the type that Scandinavia sends us.

Photograph from Frederic C. Howe

ROUMANIAN SHEPHERDS

Three-fifths of all the Roumanians who have come to America were farm laborers in the old country; yet it is rare, indeed, that one is found in the United States elsewhere than in the factory, the mine, and the railroad construction gang.

Photograph from Frederic C. Howe.

A SLOVAK MOTHER AND CHILDREN

The Slovaks are an agricultural people, occupying all of northern Hungary except Ruthenian territory. Nearly a half million of them have come to America, though many return to Europe. They came so rapidly in the years before the war that whole villages were all but depopulated, and wages increased 100 per cent in many places as a result of their departure for America.

Photograph from Frederic C. Howe

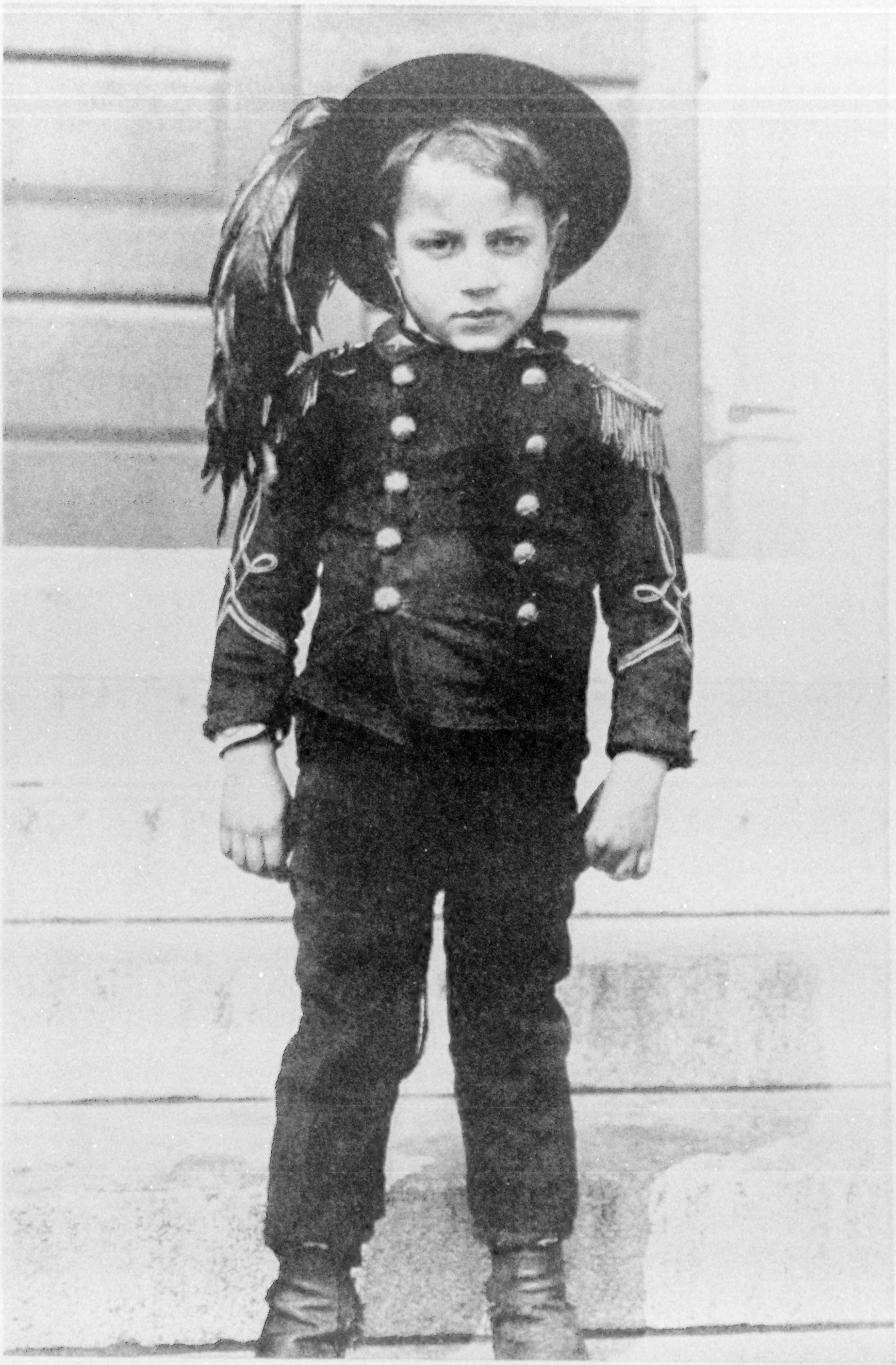
A RUSSIAN MOTHER AND HER FLOCK

"No, I was not sleeping. I just couldn't help sneezing when the camera shutter clicked."

Photograph from Frederic C. Howe

A GREEK SOLDIER OF THE ROYAL GUARD

The Greek shoe-shining emporium and the Greek popular-priced restaurants have served to distribute the Hellenic immigrants better than almost any other race of the "new" immigration; and distribution is solving the problem of their assimilation.



Photograph from Frederic C. Howe

AN ITALIAN BOY DRESSED AS A SOLDIER

Who knows but that the blood of a Cæsar, an Anthony, or a Seneca may course through the veins of this little future American?

Photograph from Frederic C. Howe

A GERMAN FAMILY TRANSPLANTED TO AMERICA

The seventh son of a seventh son is not so rare in Germany, for next to the Russians the Germans have the largest families of any people in Europe. More than six million Germans have come to this country; but five million of them came more than 27 years ago.

XUM

Photograph by A. F. Sherman

MISSIONARIES OF THE NEW YORK BIBLE SOCIETY WITH ELLIS ISLAND IMMIGRANTS

Nearly all the religious denominations and charitable organizations of New York take some part in helping the immigrants to steer clear of the pitfalls of the metropolis

A TYPICAL JEWISH FAMILY FROM RUSSIA

Among the Jews who came to America from Russia before the war were thousands of families like this one. Even amid direst poverty and the most insanitary surroundings many of them are able to triumph over dirt and disease by adhering to that remarkable code of personal hygiene laid down in the laws of Moses.

Photograph from Frederic C. Howe

THREE COSSACKS AT ELLIS ISLAND

These warriors of the Russian plain make sturdy Americans—as industrious in peace as they were intrepid in battle

Photograph from Frederic C. Howe

A LARGE SCOTCH FAMILY

But for the fact that our immigrant population and the people of the rural districts are more given to marriage and to large families than the urban folk of native stock, America's growth would be at a standstill. Between the disinclination to marry and the tendency toward small families, American city-living folk of native ancestry today do not have enough children to reproduce the race.

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Photograph from Frederic C. Howe

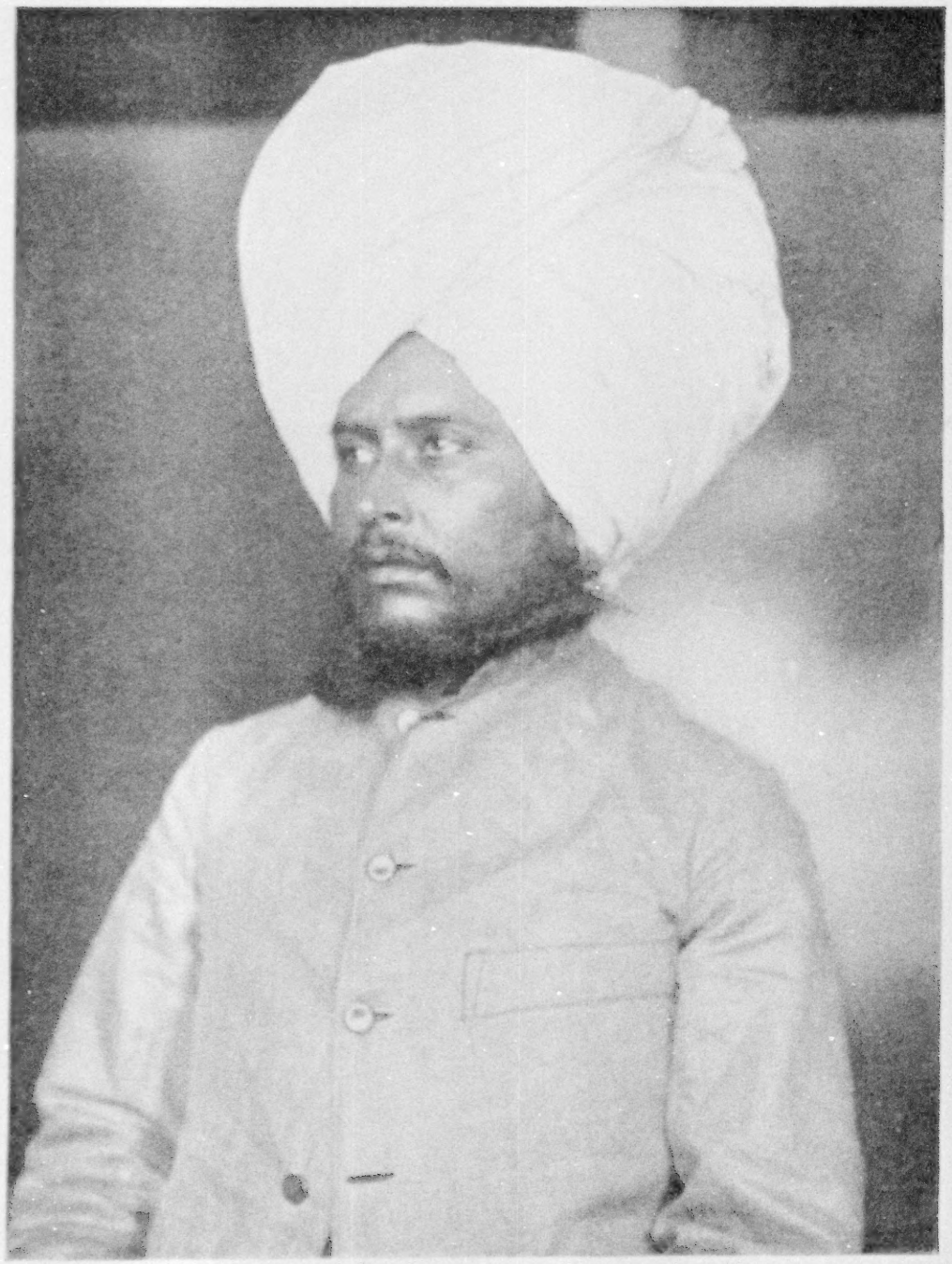
AN ENGLISH FAMILY: MOTHER AND NINE CHILDREN

Like her sturdy prototypes of colonial times, this good mother has come to found in America a home for her posterity. Think of the self-denial it requires to feed nine hungry mouths and to clothe nine growing children in this era of high prices. Yet love has lightened labor.

Photograph from Frederic C. Howe

A GROUP OF SERBIAN GYPSIES

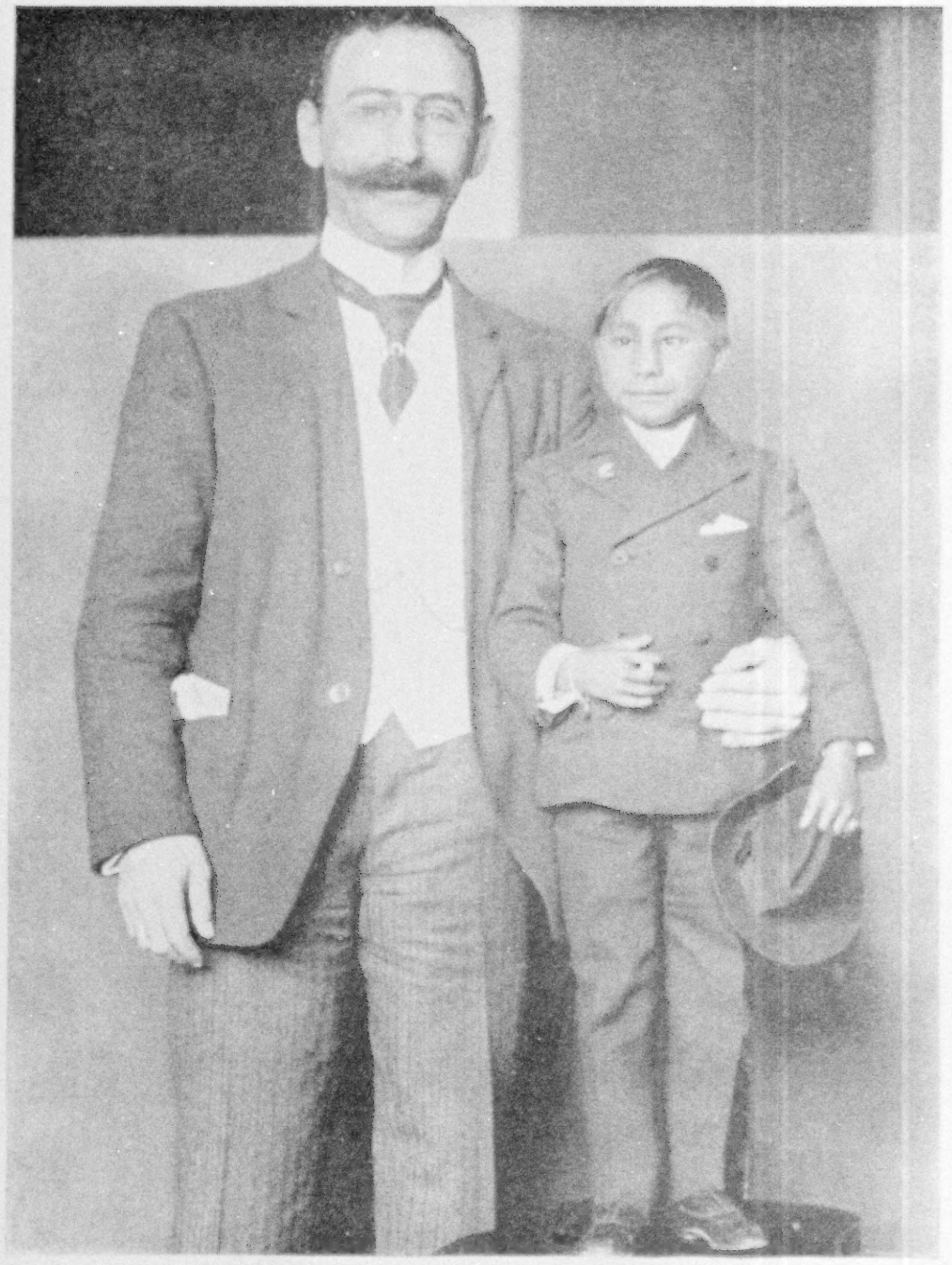
Ethnological measurements show that even the very bones of the immigrant's body are warped into an American type in his children and his children's children. What could be more eloquent than this of the success of the processes of Americanization as the generations rise and pass!



Photograph from Frederic C. Howe

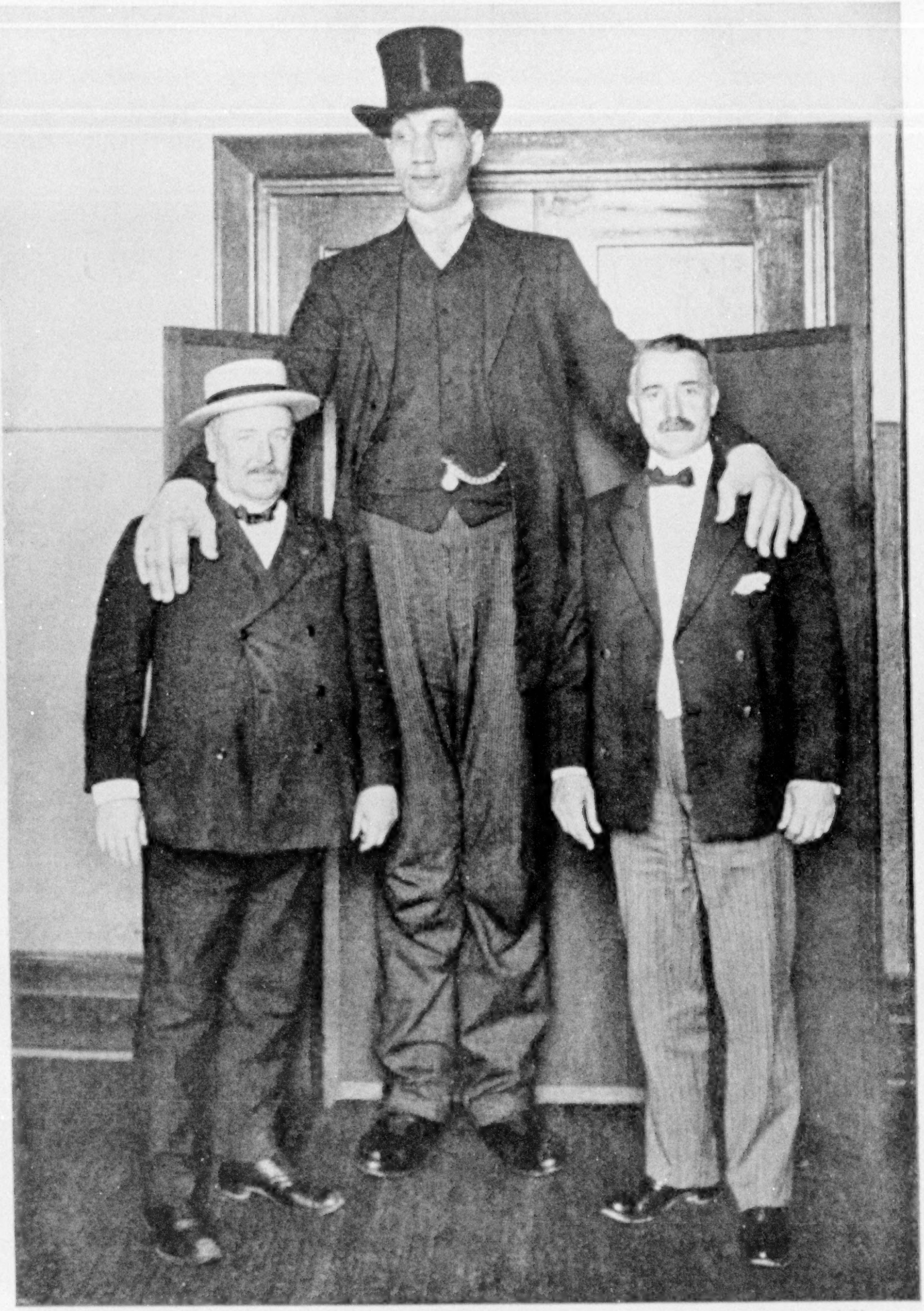
A HINDU FROM INDIA

In no other race furnishing immigrants to America is the percentage of women coming so small as among the Hindus



A DWARF FROM BURMA

He is not too small to enjoy his cigarette nor to be proud of his bracelet



Photograph from Frederic C. Howe

A RUSSIAN GIANT, SEVEN FEET NINE INCHES TALL, WITH TWO MEN OF NORMAL SIZE

The Russians who come to America are a sturdy, hardy, seasoned race, but not all of them are as large as this giant, who can look down upon 99.9999 per cent of all mankind

PRIZES FOR THE INVENTOR*

Some of the Problems Awaiting Solution

By Alexander Graham Bell

WHAT a glorious thing it is to be young and have a future before you. To the graduates, especially, of a scientific technical school like the McKinley Manual Training School the outlook for the future looks bright and promising.

When I was a young man the institutions of learning, the higher schools and colleges, paid a great deal more attention to the teaching of Latin and Greek than to the study of science; they made scholars rather than scientists.

The war has changed all that, and the man of science will be appreciated in the future as he never has been in the past. Knowledge is power; and we now realize that the nation that fosters science becomes so powerful that other nations must, if only in self-defense, adopt the same plan. It is safe to say that scientific men and technical experts are destined in the future to occupy distinguished and honorable positions in all the countries of the world. Your future is assured.

WE PROGRESS FROM CANDLES TO ELECTRICITY IN ONE LIFETIME

I said it was a glorious thing to be young; but it is also a glorious thing to be old and look back upon the progress of the world during one's own lifetime.

Now, I don't mean to insinuate that I am old, by any means! I had in mind an old lady, who is now living in Baltimore, at the age of one hundred and seven—she is now in her one hundred and eighth year—with mental faculties unimpaired. Possessed of a bright and active mind, she is able, from her own personal recollections, to look back upon a whole century of progress of the world.

She was born in England and came over to America when quite young; and it is rather interesting to know what brought the family here. The father was a wholesale candlemaker in London and his business was ruined by the introduction of gas!

Gas as an illuminant is now being replaced by electric lighting; and there are many people in this room who saw the first electric lights.

I, myself, am not so very old yet, but I can remember the days when there were no telephones.

I remember, too, very distinctly when there were no automobiles here. There were thousands of horses, and Washington, in the summer-time, smelled like a stable. There were plenty of flies, and the death rate was high.

Now, it is very interesting and instructive to look back over the various changes that have occurred and trace the evolution of the present from the past. By projecting these lines of advance into the future, you can forecast the future, to a certain extent, and recognize some of the fields of usefulness that are opening up for you.

Here we have one line of advance from candles and oil lamps to gas, and from gas to electricity; and we can recognize many other threads of advance all converging upon electricity. We produce heat and light by electricity. We transmit intelligence by the telegraph and telephone, and we use electricity as a motive power. In fact, we have fairly entered upon an electrical age, and it is obvious that the electrical engineer will be much in demand in the future. Those of you who devote yourselves to electrical subjects will certainly find a place and room to work.

*An address to the graduating class of the McKinley Manual Training School, Washington, D. C., February 1, 1917, revised for the National Geographic Magazine.

XUM

THE NEW YORK SKY-LINE AT NIGHT

Even more wonderful than the dizzy heights of the buildings is the blaze of electricity radiating from them. People now living remember the time when there was no gas and candles were universal (see page 131).

XUM

FROM THE "HOBBY-HORSE" TO THE MOTOR-CYCLE OF 130 MILES SPEED

Then there is that other line of advance typified by the substitution of automobiles for horse-drawn vehicles. In line with this is the history of the bicycle. First, we had the old French "hobby-horse," the ancestor of all our bicycles and motor-cycles. Upon this you rode astride, with your feet touching the ground, and propelled the machine by the action of walking. Then came the old "bone-racker," in which your feet were applied to pedals attached to a crank-shaft on the front wheel of the machine.

This was superseded by a bicycle with an enormous front wheel, about six feet in height, with a little one behind—a most graceful machine, in which the rider appeared to great advantage. There was none of that slouchy attitude to which we are so accustomed now. The rider presented a graceful and dignified appearance, for he had perforce to sit upright, and even lean a little backward, to avoid the possibility of a header! The large wheel also appeared behind and the small one in front, and a tumble over backward was felt to be less disastrous than a header forward. It was much safer to alight upon your feet behind than to be thrown out forward upon your head.

Then came the "safety bicycle"—a return to the form of the old "hobby-horse," but not a "bone-racker," because provided with rubber tires. In this machine the power was transmitted from the feet to the wheels by means of gearing. This is still the form of the modern bicycle; but a gasoline motor has been added to do the work of the feet, giving us the power of going faster than railroad trains, on the common roads of the country, and without any physical exertion at all. I believe the speed record upon race-tracks stands at about 137 miles an hour.

MANY CHANCES FOR THE INVENTOR

On every hand we see the substitution of machinery and artificial motive power for animal and man power. There will therefore be plenty of openings in the future for young, bright mechanical engineers working in this direction.

There is, however, one obstacle to further advance, in the increasing price of the fuel necessary to work machinery. Coal and oil are going up and are strictly limited in quantity. We can take coal out of a mine, but we can never put it back. We can draw oil from subterranean reservoirs, but we can never refill them again. We are spendthrifts in the matter of fuel and are using our capital for our running expenses.

In relation to coal and oil, the world's annual consumption has become so enormous that we are now actually within measurable distance of the end of the supply. What shall we do when we have no more coal or oil!

Apart from water power (which is strictly limited) and tidal and wave power (which we have not yet learned to utilize), and the employment of the sun's rays directly as a source of power, we have little left, excepting wood, and it takes at least twenty-five years to grow a crop of trees.

POSSIBILITIES OF ALCOHOL

There is, however, one other source of fuel supply which may perhaps solve this problem of the future. Alcohol makes a beautiful, clean, and efficient fuel, and, where not intended for consumption by human beings, can be manufactured very cheaply in an indigestible or even poisonous form. Wood alcohol, for example, can be employed as a fuel, and we can make alcohol from sawdust, a waste product of our mills.

Alcohol can also be manufactured from corn stalks, and in fact from almost any vegetable matter capable of fermentation. Our growing crops and even weeds can be used. The waste products of our farms are available for this purpose and even the garbage from our cities. We need never fear the exhaustion of our present fuel supplies so long as we can produce an annual crop of alcohol to any extent desired.

The world will probably depend upon alcohol more and more as time goes on, and a great field of usefulness is opening up for the engineer who will modify our

XUM

A LABYRINTH OF BRIDGES ACROSS CUYAHOGA RIVER, CLEVELAND, OHIO, INCLUDING THE NEW HIGH-LEVEL BRIDGE IN COURSE OF CONSTRUCTION

machinery to enable alcohol to be used as the source of power.

Evolution in science has not always been accomplished by a series of gradual changes, each small in itself, but cumulative in effect. There have also been sudden "mutations" followed by advances of knowledge by leaps and bounds in a new direction, and the establishment of new and useful arts never before even dreamed of by man.

Although Clerk-Maxwell and others had long ago enunciated the theory that light and electricity were vibratory movements of the so-called "ether" or luminiferous medium of space, differing chiefly in frequency from one another, the world was not prepared for the experiments of Hertz, who demonstrated the reality of the conception and actually measured the wave-length of electrical discharges. Still less was it prepared for the discovery that brick walls and other apparently opaque objects were as transparent to the Hertzian waves as glass is to light. These experiments formed the basis for numerous other startling discoveries and practical applications for the benefit of man.

WE CAN SEE OUR OWN HEARTS BEAT

Flesh proved to be transparent to the Roentgen rays, and the world was fairly startled by the first X-ray photographs of the bones in the living human hand. Now physicians and surgeons use X-ray lamps to enable them to see bullets and other objects imbedded in flesh, and have even devised means of observing the beating of the heart and the movements of other internal organs without pain to their patients.

Other developments of the Hertzian waves have resulted in the creation of the new art of wireless telegraphy. Most of us, I think, can remember the first S.O.S. signals sent out by a ship in distress and the instant response from distant vessels equipped with the Marconi apparatus. Then came the rush of vessels to the scene of disaster and the rescue of the passengers and crew.

Developments of wireless telegraphy are proceeding with great rapidity, and no man can predict what startling discoveries and applications may appear in the near future. Here may be an opening for some of you, and I know of no more promising field of exploration to recommend to your notice.

HONOLULU EAVESDROPS WHILE WASHINGTON TALKS TO PARIS

Already privacy of communication has been secured by wireless transmitters and receivers "tuned," so to speak, to respond to electrical vibrations of certain frequencies alone. They are sensitive only to electrical impulses of definite wave-length. The principle of sympathetic vibration operating tuned wireless receivers has also been applied to the control of machinery from a distance and the steering of boats without a man on board. The possibilities of development in this direction are practically illimitable, and we shall probably be able to perform at a distance by wireless almost any mechanical operation that can be done at hand.

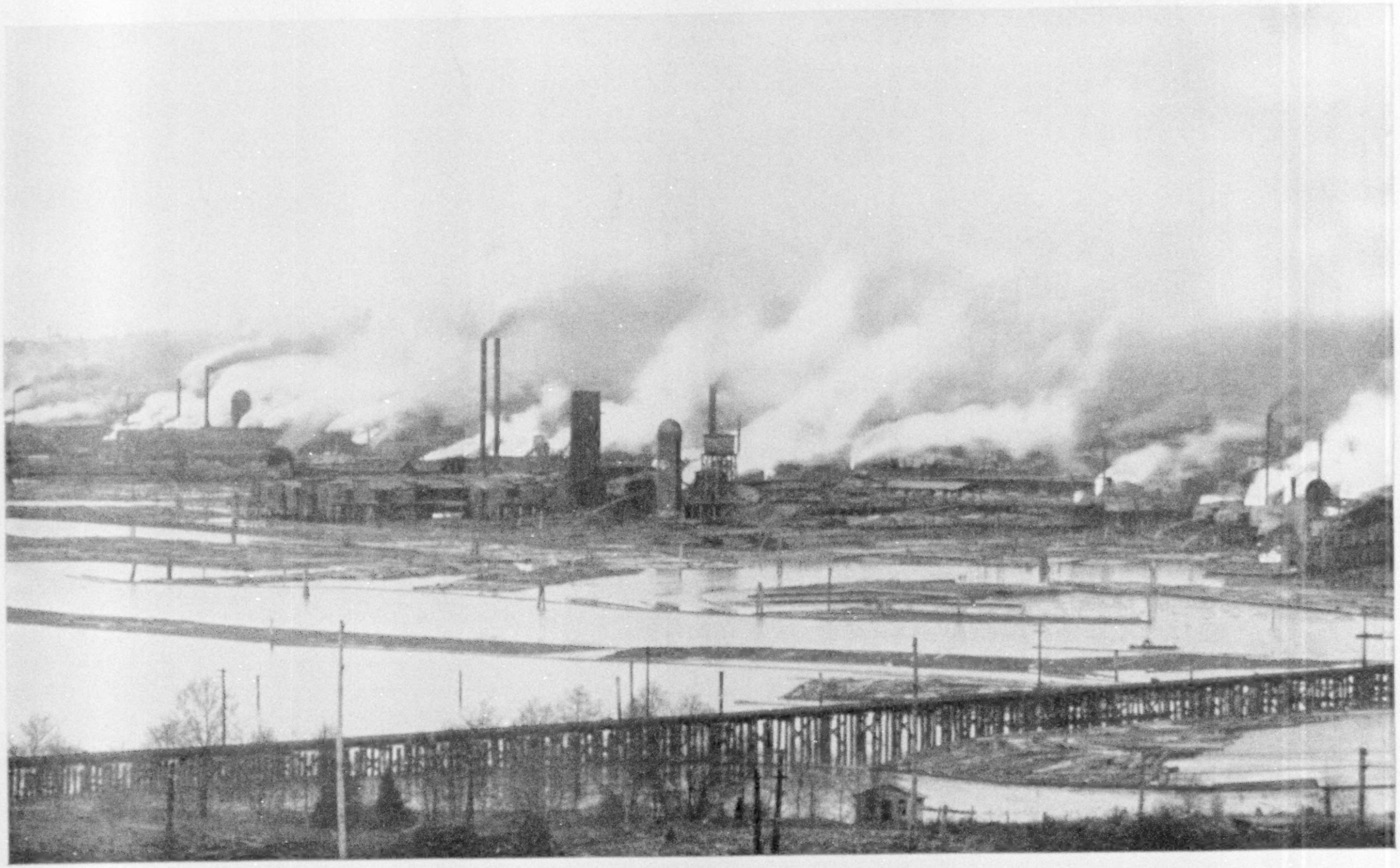
Still more recently wireless telegraphy has given birth to another new art, and wireless telephony has appeared. Only a short time ago a man in Arlington, Va., at the wireless station there, talked by word of mouth to a man on the Eiffel Tower in Paris, France. Not only that, but a man in Honolulu overheard the conversation! The distance from Honolulu to the Eiffel Tower must be 8,000 miles at least — one-third the distance around the globe—and this achievement surely foreshadows the time when we may be able to talk with a man in any part of the world by telephone and without wires.

OUR MOST CHERISHED THEORIES UPSET BY A WOMAN

The above illustrations exhibit what we might call "mutations" of science; but the greatest of all these mutations was the discovery that opened the twentieth century, and I may add for the encouragement of our young lady graduates that it was made by a woman. I allude to the discovery of radium by Madame Curie of Paris.

Radium has recently upset our most cherished theories of matter and force. The whole subject of chemistry has to be

XUM



LUMBER MILLS AT SEATTLE, WASHINGTON

The greater forests remaining in the United States, mainly of Douglas fir, red cedar, spruce, and hemlock, extend west from the crest of the Cascade Ranges to the ocean. Seattle is, therefore, the center of the lumber industry of the Pacific Northwest. The major part of all the shingles manufactured in the country are made in the State of Washington.

rewritten and our ideas of the constitution of matter entirely changed. Here is a substance which emits light and heat and electricity continuously without any apparent source of supply. It emits light in the dark, and in a cool room maintains itself constantly at a higher temperature than its environment.

It emits the Roentgen rays without any electrical machinery to produce them, and we have now discovered emanating from that substance several different kinds of rays of the unknown or X-ray variety; and we now recognize the Alpha, Beta, and Gamma rays as distinct varieties, having different properties.

Though radium behaves like an elementary substance, it is found in process of time to disintegrate into other elementary substances quite different from the original radium itself. Helium is one of its products, and, after several transmutations, it apparently turns into lead!

Our forefathers believed firmly in the transmutation of metals, one into the other, and vainly sought a means of transmuting the baser metals into gold. Radium shows that there is some foundation for the transmutation theory, and that at least some of the so-called elements originate by a process of evolution from other elements quite distinct from themselves. Where this line of development is going to lead is a problem indeed, and radium still remains the great puzzle of the twentieth century.

DYING OF THIRST IN A FOG

I cannot hope to bring to your attention all of the problems that are awaiting solution, but I think it may be interesting to you to hear of a few upon which I myself have been working. What interests me will probably interest you, and perhaps some of you may carry out the experiments to a further point than I have done.

You know that although I am a lover of Washington, yet, when the summertime comes, I go just as far away from Washington as I can in the direction of the North Pole. I have a summer place in Cape Breton Island, Nova Scotia, where I can always be sure of cool, fresh breezes, while you poor people are broiling here in Washington.

A good many of the people on Cape Breton Island are fishermen, who make their living on the Banks of Newfoundland; and one of the men employed upon my place had two uncles who were fishermen on the Banks. One day they left their vessel in a dory to look after their nets, and while they were gone a fog came up and they were unable to find their way back. The dory drifted about in the ocean for many days and was then picked up with their dead bodies on board; they had perished from exposure and thirst.

Now it is not a very unusual thing on the Banks of Newfoundland for fishermen to be separated from their vessels by fog. Every year dories are picked up at sea, and the occupants are often found to be suffering terribly from thirst. They have found "water, water, everywhere, but not a drop to drink." Now, it seemed to me that it was really a reflection upon the intelligence of man that people should die of thirst in the midst of water.

There is the salt water of the sea, and all you have to do is to separate the salt from the water and drink the water. That is one problem.

CONDENSING THE WATER VAPOR IN THE HUMAN BREATH

But there is also the fog which prevents you from reaching your vessel, and what is fog but fresh water in the form of cloud. Therefore all you have to do is to condense the fog and drink it. That is another problem.

But there is still another alternative. Water vapor exists in your breath. Why not condense your breath and drink it? This problem is easily solved; just breathe into an empty tumbler and at once you have a condensation of moisture on the inside. If you have the patience to continue the process for a few minutes, you will soon find clear water at the bottom of the tumbler.

I took a bucket of cool salt water from the sea, put it down in the bottom of a boat between my knees, and then put into it a large empty bottle the size of a beer bottle, which floated in the water with

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the neck of the bottle resting on the edge of the bucket. Then I took a long glass tube, over a meter in length, and put one end into the bottle and the other end in my mouth. I sat back comfortably in a chair with the tube between my lips and inhaled through the nostrils and blew down through the tube. This process was so easily performed that I found I could read a book while it was going on.

I therefore continued the experiment for over two hours, and then I found a considerable amount of water in the bottle, quite enough for a moderate drink. It might not be very much for us, but if you were dying of thirst on the open sea you would be glad enough to get what was there. I tasted the water and found it quite fresh, although I must confess it did not have a very palatable taste; in fact, the water condensed from my breath had a taste of—of tobacco! But I don't suppose that would have mattered much to a man who was dying of thirst.

I have also made experiments to condense drinking water from fog. A large pickle jar was provided and two long glass tubes were let down through the cork. The jar was then submerged at the wharf, with the two pipes sticking up above the surface. The experiment was then made to pump fog down through one of the pipes, the other serving as a vent. This was accomplished by means of a pair of bellows provided with a spiral spring between the handles to keep them apart. This apparatus was fastened on top of the wharf. A heavy log of wood was floated upon the water below, connected by means of a string with the upper handle of the bellows.

THE CORK THAT FAILED

The waves moved this log up and down and worked the bellows. The nozzle was connected to one of the pipes leading to the submerged empty jar and at once the bellows began to pump the fog into the jar. It continued pumping all night, and I let it go on pumping all of the next day, because there was to be a meeting of men on my place the next evening, and I thought it would be interesting to open the jar at the men's meeting. With great ceremony the jar was removed to the warehouse and was found to be nearly full of beautiful clear water. A British naval officer was present and offered to be the first to taste the water condensed from fog. He took a good mouthful of it, while the men gathered around in great excitement and shouted, "Fresh or salt?"

He did not reply, but made a face. He then rushed for the window, spat the water out, and exclaimed, "Salt!" Now, this failure did not by any means prove that the process was wrong, but simply showed that it might be advisable in the future, if you use a cork, to employ one that fits tightly and does not leak. The one I used had a hole in it, I found out afterward.

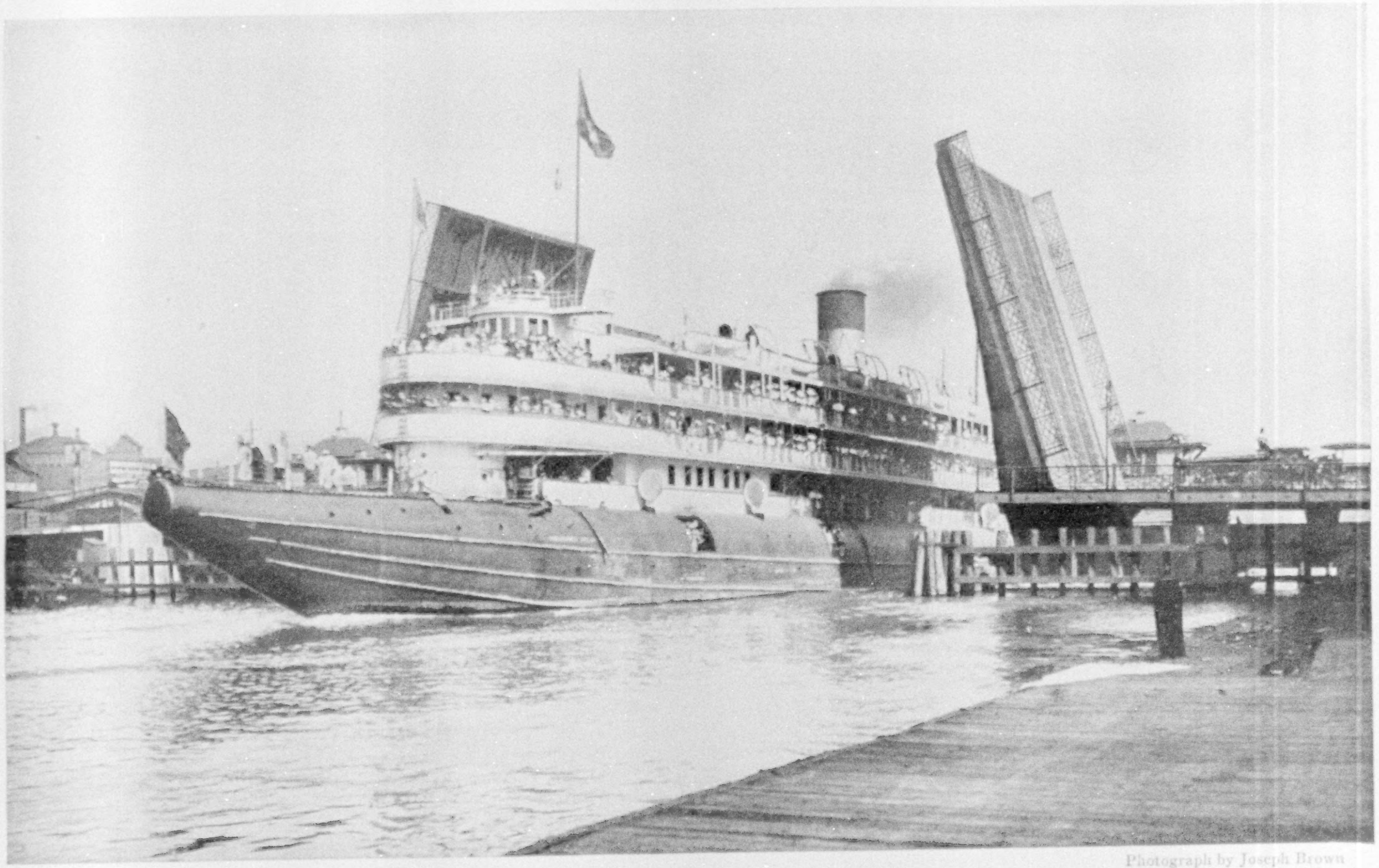
An involuntary experiment relating to the condensation of fresh water from the sea was made in Cape Breton. A man fell overboard and was rescued, with his clothes wringing wet with sea-water. There was a cold wind blowing and he took refuge in a little cabin on the boat covered with a tarpaulin awning. In a little time he began to steam. The heat of his body warmed the sea-water in his clothes, and there actually arose a cloud of steam which condensed on the cold tarpaulin and ran down the sides. It was fresh water, and if it had been collected in a jar there would have been quite enough for a drink.

"WE DO NOT BOIL THE SEA"

On large ocean steamers all the drinking water used is condensed from the sea; and we somehow or other have the idea that it is necessary to boil the sea-water, or at least have it very hot, and then condense it by means of ice or something very cold. Now, that is not necessary at all. Just think of this: All the fresh water upon the globe comes from the sea, and we do not boil the sea. Water vapor is given off by the sea everywhere and at all temperatures; it is even evaporated from ice and snow. Of course, the warmer the sea-water is, the greater is the amount of water vapor thrown out; but water vapor is everywhere present, and the main point in condensation is that it is removed from the surface by the action of the wind and carried to cooler places, where condensation occurs

BRINGING INTO SAN DIEGO HARBOR A LOG RAFT CONTAINING 5,000,000 FEET

The raft has journeyed down the coast from Portland, Oregon, where this type of raft was invented



Photograph by Joseph Brown

PASSING A DRAWBRIDGE: MILWAUKEE, WISCONSIN

The advent, about 1889, of the whale-back type of cargo carriers revolutionized the transportation problems of grain and ore industries of the Great Lakes region. The steamer in the picture is a combination excursion and cargo whale-back type.

in the form of cloud or rain. No great amount of heat is required to produce evaporation and no great amount of cold is necessary to effect condensation.

Such considerations as these may lead to some cheap industrial process for the manufacture of fresh water from the sea. All that is necessary is a current of air over your salt water to remove the water vapor collected there, and then the carrying of this confined current into a cool reservoir where the water may condense.

THE THERMOS-BOTTLE IDEA APPLIED TO A WATER TANK

As little or no artificial heating is required, a great saving can be effected in the matter of fuel. It is extraordinary how wasteful we are in our means of producing heat and in retaining it after it has been produced. It is safe to say that a great deal more heat goes up the chimney than we utilize from a fire. Then when we cook our dinner or boil water, we allow the heat to escape by radiation and the things soon cool.

A cosy for our teapot, a fireless cooker for our dinner, and a thermos bottle for our heated liquids show how much heat may be conserved by simply taking precautions to prevent radiation. Our hot-water boilers are not protected by coverings of asbestos paper or other insulating material, so that the water gets too cool for a warm bath very soon after the fire is put out.

I have made experiments to ascertain whether some of the heat wasted by radiation could not be conserved by insulating materials, with rather astonishing results. A large tank of zinc was made which would hold a great deal of water. This was inclosed in a box very much larger than itself, leaving a space of about three or four inches all around, which was filled with wool. I then found that hot water put into that tank cooled almost as slowly as if it had been a thermos bottle.

I then attempted to save and utilize some of the heat given off by a student's lamp. A couple of pipes were led out of this insulated tank and placed in a hood over the lamp. Thus a circulation of water was effected. The water heated by the lamp found its way up into the tank and produced a sensible rise of temperature there. Next day when the lamp was again lighted it was found that the water in the tank still felt slightly warm. It had not lost all of the heat it had received at the former heating. When the lamp was again put out, the temperature of the tank was considerably higher than on the former occasion.

This process of heating was continued for a number of days, and it became obvious that a cumulative effect was produced, until at last the water in the tank became too hot to hold the hand in, and it was determined to see how long it would hold its heat. The temperature was observed from time to time, and more than a week after the lamp had been put out the water was still so warm that I used it for a bath.

CUTTING DOWN THE CHIMNEY TAX

Since then this insulated tank has been taken up to the attic of my house in Nova Scotia and has been installed there as a permanent feature. I have the habit of working at night and like to take a warm bath somewhere about 2 o'clock in the morning. Unfortunately the heating arrangements in the house have given out long before that hour and only cold water comes from the kitchen boilers. I connected the insulated tank with an iron pipe let down my study chimney in the hope of saving and utilizing some portion of the heat that escaped up the chimney every time the fire was lighted.

I have had this apparatus in use for over a year, and find that at any time of the day or night I am always sure of a warm bath from the heat that used to be wasted in going up the chimney. In this case there was only one straight pipe, so that the amount of heat recovered bears only a small proportion to that still wasted. A coil of pipe in the chimney or special apparatus there would, of course, be much more efficient.

I think that all the hot water required for the use of a household, and even for warming a house, could be obtained without special expenditure for fuel by utilization of the waste heat produced from

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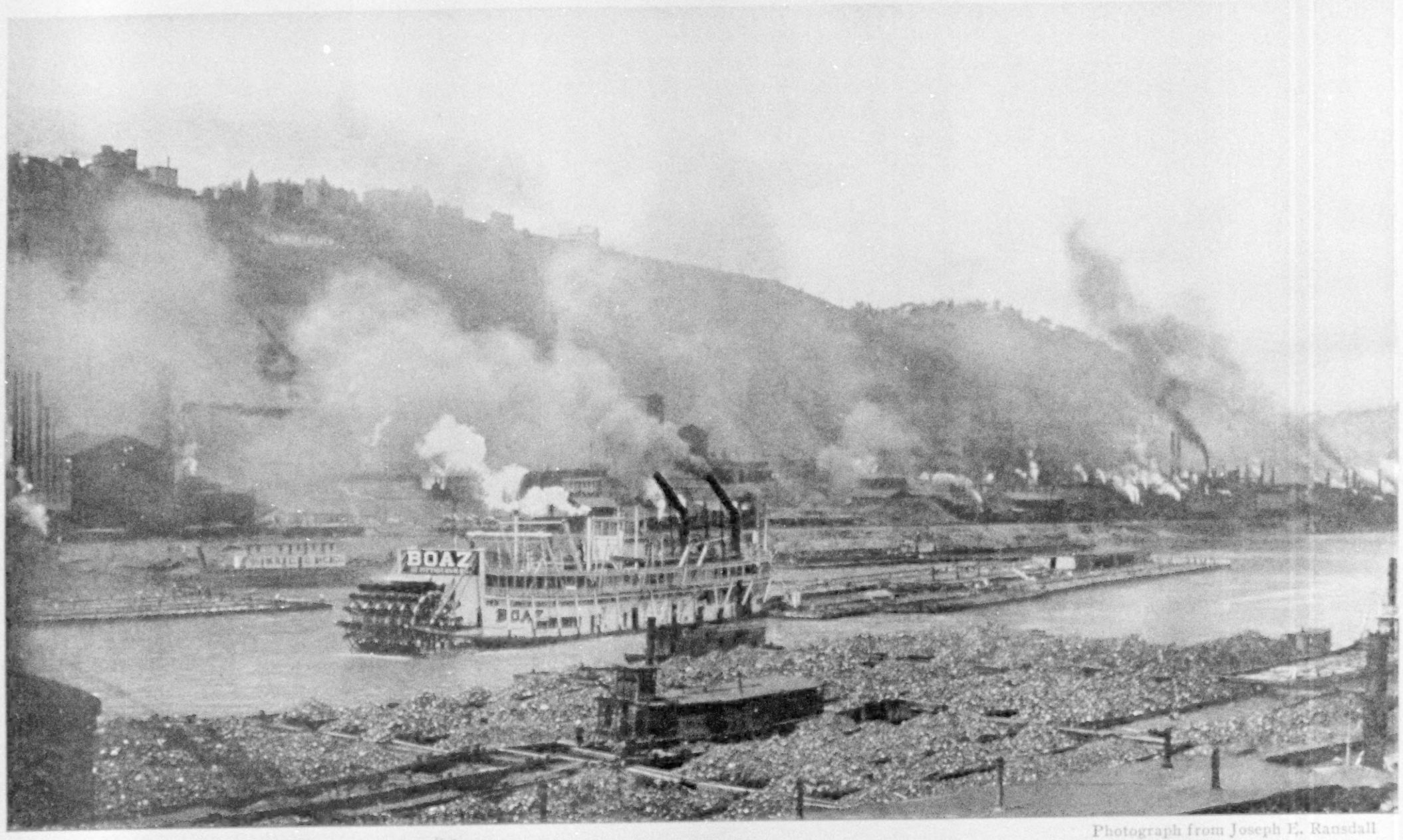


Photograph from Joseph E. Ransdall

THE DEPARTURE OF THE GREAT COAL FLEET, PITTSBURGH HARBOR

The use of anthracite coal is comparatively new. The year that our Declaration of Independence was signed anthracite had no more value than the most useless stone, and it was not until fifty years later that its effectiveness was discovered.

the kitchen fire and the heat given off by the illuminants employed.

Of course, water can only be heated to the boiling temperature; but there are many liquids that can be heated to a very much higher temperature than this without boiling. I took a tumbler of olive oil and heated it by means of a thin iron wire connected with a voltaic battery. I placed in the tumbler of oil a test-tube filled with water. In a short time the water was boiling, but the oil remained perfectly quiescent. If you store up hot oil instead of water you will have at your command a source of heat able to do all your cooking, and even produce steam power to work machinery.

We have plenty of heat going to waste in Washington during the summer-time, for the sun's rays are very powerful, and we do not use the roofs of our buildings except to keep off the rain. What wide expanses of roof are available in all our large cities for the utilization of the sun's rays! Simple pipes laid up on the roof and containing oil or some other liquid would soon become heated by the sun's rays. The hot oil could be carried into an insulated tank and stored. You could thus not only conserve and utilize the heat that falls upon the tops of your houses, but effect some cooling of the houses themselves by the abstraction of this heat.

THE REASON WE CANNOT KEEP OUR HOUSES COOL

I was once obliged, very much against my will, I can assure you, to remain in Washington right in the midst of the summer, and the thought kept constantly recurring to my mind, If man has the intelligence to heat his house in the winter-time, why does he not cool it in the summer? We go up to the Arctic regions and heat our houses and live. We go down to the Tropics and die. In India the white children have to be sent home to England in order to live, and all on account of the heat. The problem of cooling houses is one that I would recommend to your notice, not only on account of your own comfort, but on account of the public health as well.

Now, I have found one radical defect in the construction of our houses that absolutely precludes the possibility of cooling them to any great degree. You will readily understand the difficulty when you remember that cold air is specifically heavier than warm air. You can take a bucket of cold air, for example, and carry it about in the summer-time and not spill a drop; but if you make a hole in the bottom of your bucket, then, of course, the cold air will all run out.

Now, if you look at the typical tropical houses, you will find that they are all open on the ground floor. Supposing it were possible to turn on a veritable Niagara of cold air into a tropical house, it wouldn't stay there five minutes. It would all come pouring out through the open places below and through the windows and doors. If you want to find your leakage places, just fill your house with water and see where the water squirts out!

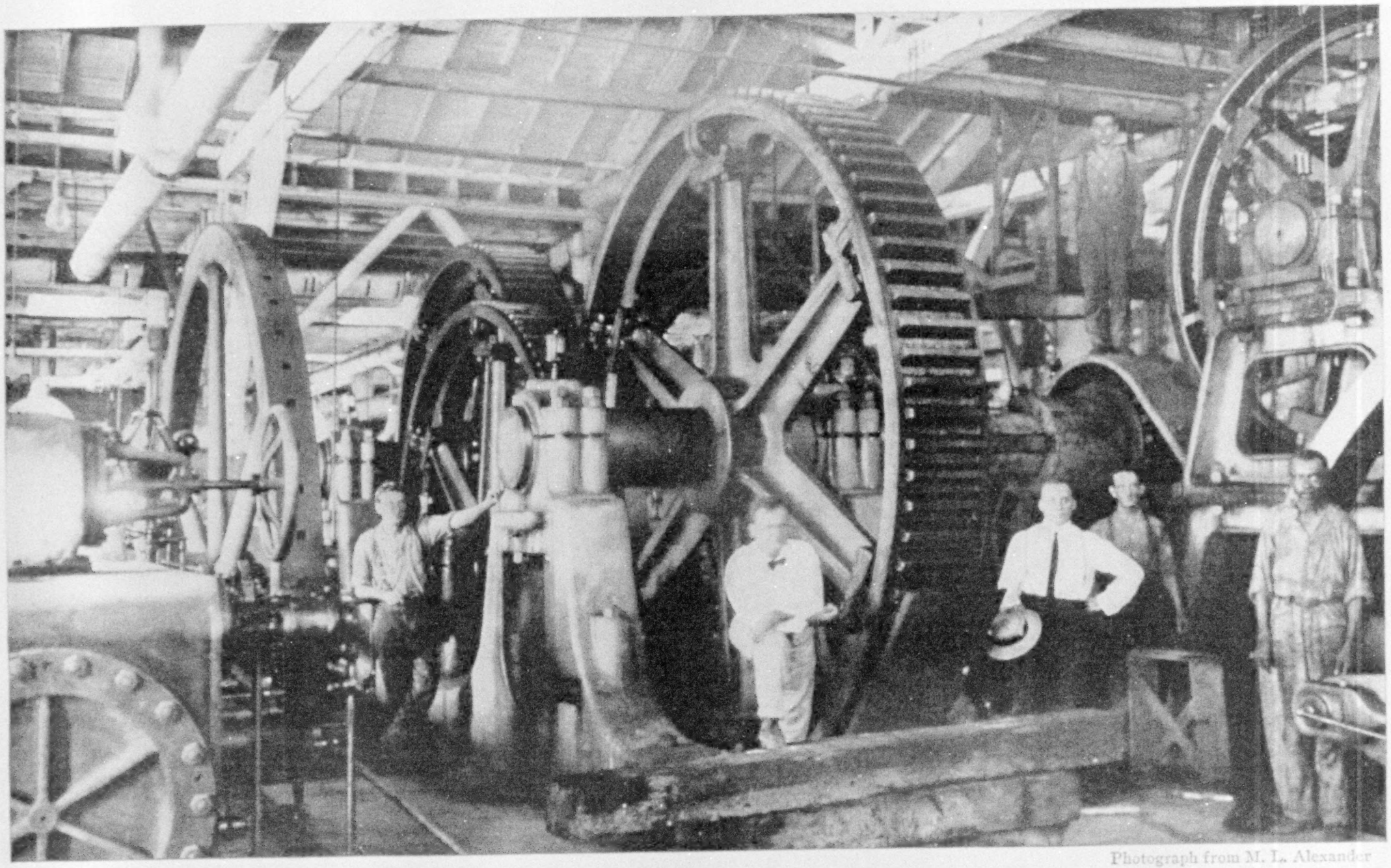
I began to think that it might be possible to apply the bucket principle to at least one room in my Washington home, and thus secure a place of retreat in the summer-time. It seemed to be advisable to close up all openings near the bottom of the room to prevent the escape of cold air and open the windows at the top to let out the heated air of the room.

MY OWN EXPERIMENTS

Now, it so happens that I have in the basement of my house a swimming tank, and it occurred to me that since this tank holds water, it should certainly hold cold air; so I turned the water out to study the situation. The tank seemed to be damp and the sides felt wet and slimy.

I reflected, however, that the condensation of moisture resulted from the fact that the sides of the tank were cooler than the air admitted. Water vapor will not condense on anything that is warmer than itself, and it occurred to me that if I introduced air that was very much colder than I wanted to use, then it would be warming up in the tank and becoming dryer all the time. It would not deposit moisture on the sides and would actually absorb the moisture there.

I therefore provided a refrigerator, in which were placed large blocks of ice



Photograph from M. L. Alexander

SUGAR-MAKING MACHINERY

The making of sugar, even after harvesting the cane, is a costly proceeding, and sugar mills have to install monster machinery to wring the sugar from the cane. This machinery is in use but three months out of every twelve and needs constant attention.

covered with salt. This was placed in another room at a higher elevation than the tank, and a pipe covered with asbestos paper was employed to lead the cold air into the tank.

The first effect was the drying of the walls, and then I felt the level of the cold air gradually rising. At last it came over my head. The tank was full, and I found myself immersed in cool air. I felt so cool and comfortable that it seemed difficult to believe that Washington stood sizzling outside. I climbed up the ladder in the swimming tank until my head was above the surface, and then found myself breathing a hot, damp, muggy atmosphere. I therefore speedily retreated into the tank, where I was perfectly cool and comfortable.

Guided by this experience, I tried another experiment in my house. I put the refrigerator in the attic and led the cold air downward through a pipe covered with asbestos into one of the rooms of the house. The doors were kept shut and the windows were opened at the top. The temperature in that room was perfectly comfortable, about 65 degrees.

At that time the papers were speaking of some ice plant that had been installed in the White House and congratulated the President upon a temperature of only 80 degrees when the thermometer showed 100 degrees outside. At this very time I enjoyed in my house a temperature of 65 degrees (the ideal temperature), with a delicious feeling of freshness in the air. Even when the air had risen to the same temperature as the rest of the house, as measured by a thermometer, the room still felt cool, because the air was drier, thus promoting perspiration that cooled the skin.

SELLING COLD AIR IN PARIS

In this connection I may say that there is a very interesting cooling plant in Paris, France, run by the Societé de l'Air Comprimé. Very many of the cafés and restaurants in Paris have cold rooms for the storage of perishable provisions, and these rooms are cooled by compressed air supplied by this company.

The plant consists of large pipes laid down under the streets of Paris, with small branch pipes leading into the cafés and restaurants. At a central station steam-engines pump air into the pipes and keep up a continuous pressure of from four to five atmospheres. As there are several hundred kilometers of these pipes under the streets of Paris, they form a huge reservoir of compressed air at the ground temperature.

In the cooling room of a café they simply turn a little cock and admit the compressed air into the room. A gas meter measures the amount of air admitted and charges are made accordingly.

The compressed air, by its expansion, produces great cold, and the cooling effect is still further increased by allowing the air to do work during the process of expansion. Dumb-waiters, elevators, and even sewing-machines are thus run very economically in connection with the system by means of compressed-air engines.

WILL OUR CITIES BE ARTIFICIALLY COOLED?

Now, it appears to me that this process might very easily be developed into a plan for the cooling of a whole city. You would simply have to turn a cock in your room to admit the fresh air; and if you then take precautions to prevent the cold air from running away by having your room tight at the bottom and open at the top, you could keep your room cool in the hottest summer weather.

I must confess that there is one other subject upon which I would like to say a few words before closing.

One of the great evils attending our civilization is the extreme congestion of the population into the larger cities, and one of the great problems of the future is how to spread the population more equally over the land.

The congestion is caused by difficulties of transportation; for, of course, it costs much more to send a person to a distant place than to one near at hand.

But did you ever think of this: that it also costs more to send a *letter* to a distant place than to one near at hand, and yet a two-cent stamp will carry your letter anywhere within the limits of the United States, and even beyond.

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COULD POSTAGE STAMPS BE USED IN TRANSPORTATION OF PERSONS?

So many more letters are sent to places near at hand than to the remoter parts of the country that an average rate of postage very slightly in excess of the cost for short distances pays for the deficit on the longer routes. Now, the thought that I would like to put into your minds is this: Why could not the postage stamp principle be applied to the transportation of persons and goods? Why should it not be possible to charge an average rate for transportation instead of a rate increasing with the distance traveled?

We have already begun to apply this principle in municipalities. We no longer charge by distance in our large cities, and a five-cent fare will carry you anywhere you want to go within the limits of the municipality involved. As a consequence we find in these cities the poorer people abandoning tenement houses and going out into the country to live, where their children have room to grow. This relief of congestion pervades all classes of the community, and you see homes springing up everywhere in the suburbs of our great cities.

The benefits resulting from a uniform rate of transportation increase in geometrical proportion to the distance traveled, and the possible radius of travel should therefore be extended to the greatest practicable degree.

It may well be doubted whether it will ever be possible to buy a ticket for anywhere in the United States at an average rate; but it might be practicable to apply the principle to some at least of the smaller States. A citizen of Rhode Island, for example, might for a very small amount be enabled to travel anywhere within the limits of that State.

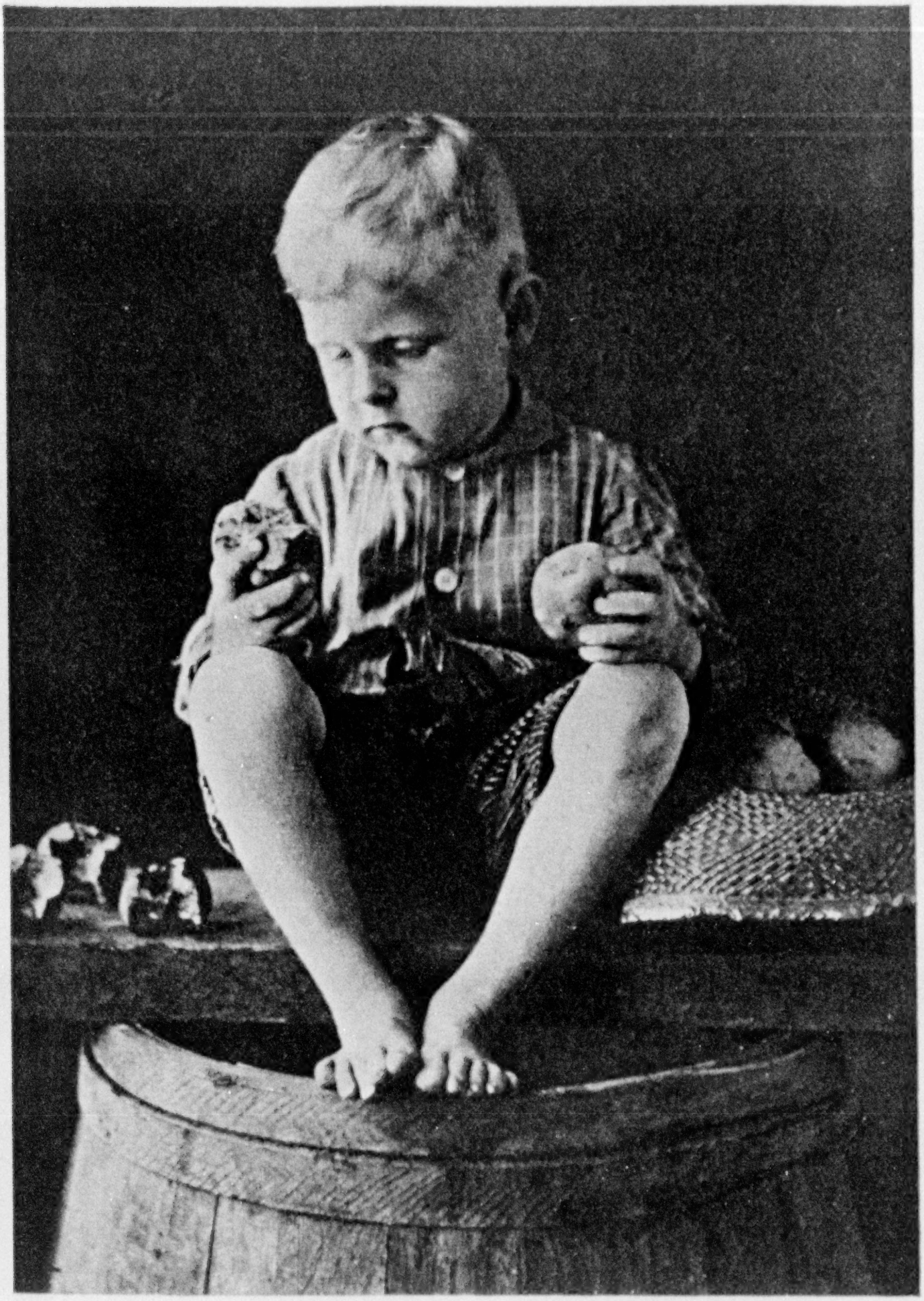
It would certainly be advisable to reduce our charges for transportation to the minimum amount possible. This can be done, first, by adopting the principle of an average rate, and, secondly, by reducing the actual cost of the transportation itself.

WILL AËRIAL LOCOMOTION SOLVE THE ROAD QUESTION?

Now, it is noteworthy that the main element of cost resides not so much in the vehicles and locomotives employed as in the cost of the roads on which they have to run; it is this element that increases with the distance.

The railroads, for example, have to expend millions of dollars in the construction of railroad tracks; and what would the automobile be worth without a good road on which to travel? Water transportation is much cheaper than railroad transportation, chiefly because we do not have to build roads in the sea for our ships.

I will conclude with this thought: that a possible solution of the problem over land may lie in the development of aërial locomotion. However much money we may invest in the construction of huge aërial machines carrying many passengers, we don't have to build a road.



Photograph by Harry F. Blanchard

THE APPLE OF DISCORD

Nature's gift to the world's small boy is an appetite all out of proportion to his capacity. This "future president" evidently has repaired to the apple cellar and made inroads upon the winter's supply of pippins. From the expression on his face, preliminary pangs in the region of his waistband are inducing solemn reflection upon the enormity of his offense.

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Photograph by Hugo Brehme

A "CHILD OF SORROW AND WOE": MEXICO

Without a square meal, a soft bed or a clean suit, what wonder that the bright sun of the Mexican highlands and the multi-hued birds and flowers cannot dispel the darkness of distress, or drive out the woe-begone look from the peon child's eye?

Photograph by A. W. Cutler

OF COURSE GRANDPA DOESN'T KNOW WHO

The old-fashioned game of "Guess Who" is as universal as childhood itself. This typical old English farmer was probably thinking about cutting his clover on the morrow, when a pair of little hands were clapped over his eyes and a well-known little voice piped, "Who is it, granddad?"

Photograph by G. Heurlin

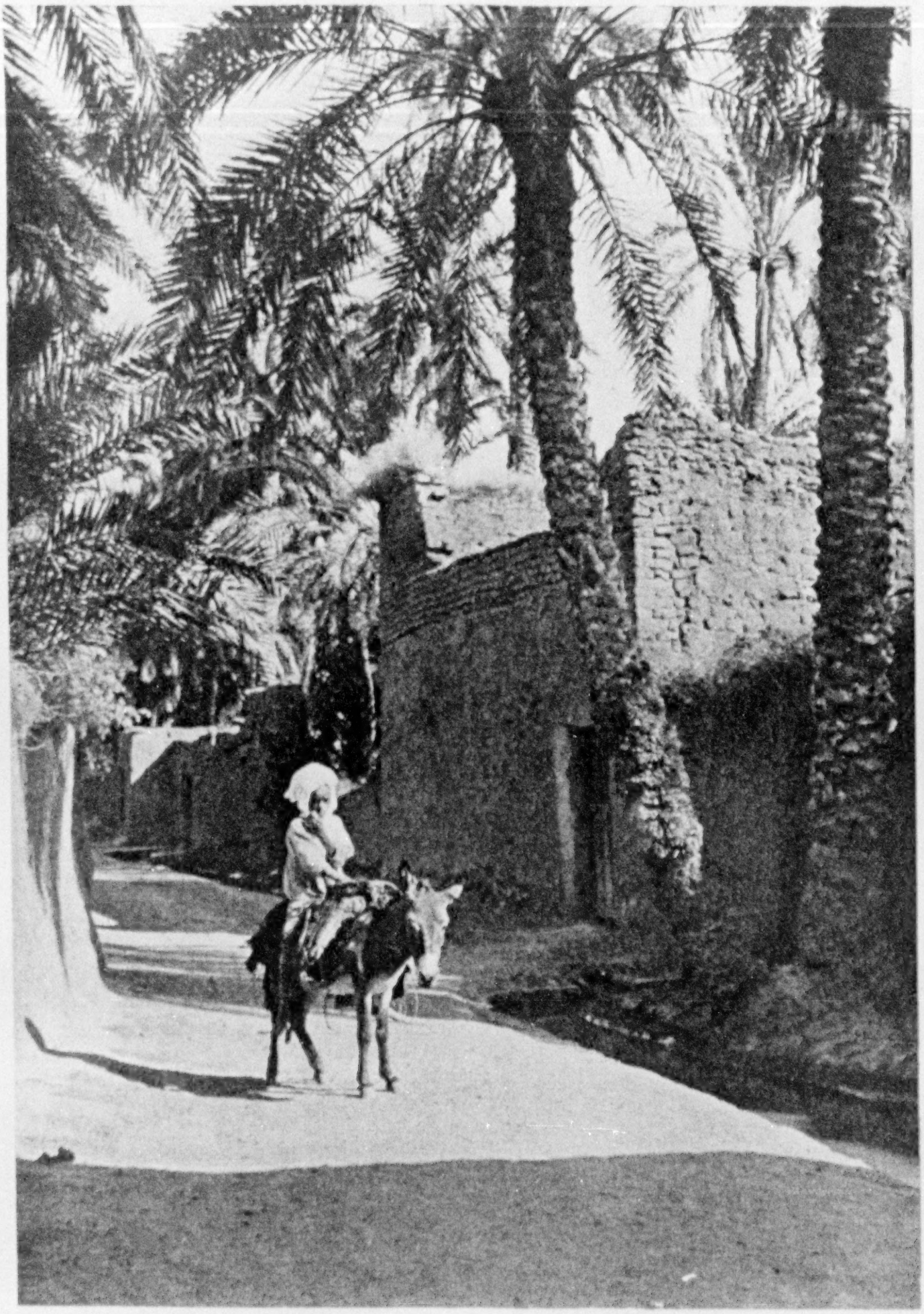
ART IN SWEDEN

The little Swedish lady who is posing for this budding portrait painter seems not quite pleased with the artist's work, judging from the expression on her face, while he, in his best professional manner, has just assured her that she will be very well satisfied with the finished picture. Children in Sweden are like children anywhere, and playtime in Scandinavia is very much like playtime anywhere else.

Photograph by W. F. Robertson

"LITTLE MOTHERS" OF NIPPON

One impression which the traveler to far Japan always carries away is that of the devotion shown by every little girl carrying a baby on her back. The camera caught this group of "little mothers" in the temple gardens at Kobe, a favorite play-spot for the children of the vicinity.



Copyright by Donald Mac Leish

THE LIGHT AND SHADE OF THE DESERT: BISKRA, ALGERIA

Every day like the preceding one, every year a duplicate of the one that went before, every century no different from the one it succeeded; the world may move elsewhere, but who can say that it moves in Biskra?

Copyright by Donald Mac Leish

A SAHARA JACK HORNER

When told that his picture was to visit the six hundred thousand homes of the American boys and girls who love the Geographic, he tried to look as dignified as a judge, as wise as a lawgiver, and as solemn as a priest. And somehow he seems to have succeeded.

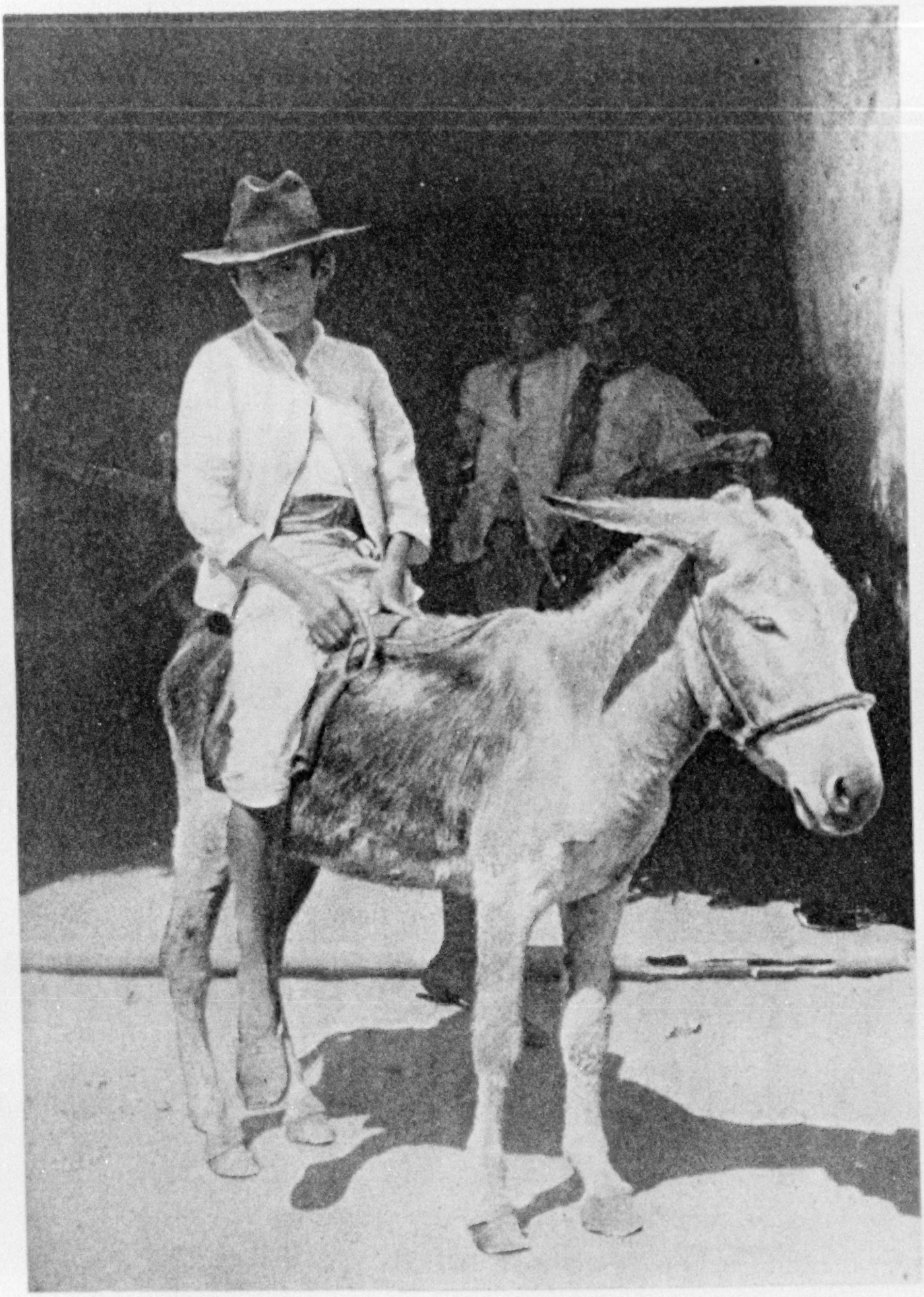
IN FULL HOLIDAY REGALIA

Way up in the corner of Montana, adjacent to Glacier National Park, is the Blackfeet Indian reservation, where this once powerful tribe now lives. Many little ones play games originated in the dim, distant past, on the rolling prairie under the shadow of the whitecapped Rockies, but nowadays they usually are dressed in nondescript garments more like the white man's attire than the Indian's. Holidays are the exception, however, and every little Blackfoot has a gorgeous beaded costume for these occasions, when the customs of their forefathers are the order of the day.

Copyright by Roland W. Reed

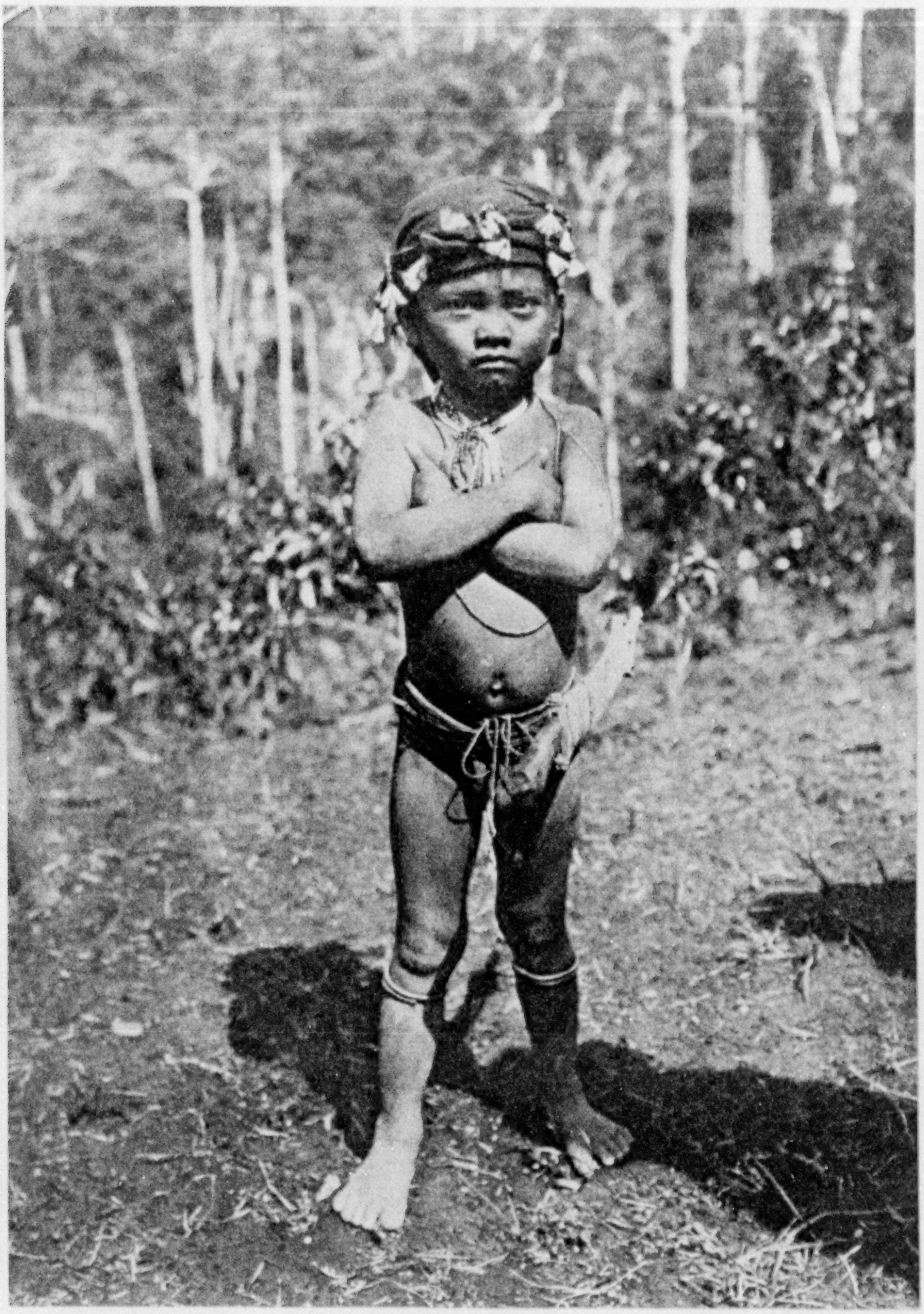
LITTLE CHIEF PACK-A-BACK GRAVELY INSPECTS THE CAMERA

This little scion of the Ojibway tribe, who lives up in northern Minnesota, will some day be a "big chief" of his people, but now he is only a small papoose who travels on his mother's back. In his restricted position, tightly wrapped to prevent his squirming out, he can move only his head and crane his neck to see the strange "paleface" with a queer black box on three legs—the camera which takes his picture.



"WELL BACK" IN SOUTH AMERICA

The young Venezuelan astride the hind quarters of his patient palfrey guides his mount with one rein of rope. The sleepy appearance of the charger indicates that not much restraint is necessary and suggests that in order to be guided he must first be started.



Photograph by Charles Martin

LOOK OUT, OR OFF GOES YOUR HEAD!

This youthful headhunter of the Philippine Islands is a son of a chief of the warlike Ilongote tribe, and he lives in the mountains of northern Luzon. The greater part of his costume is worn upon his head, and the little ornaments that look like trout flies are really tassels of white horsehair, highly prized by these people. Indeed, strands of horsehair are often more desirable than money in these mountain fastnesses, and burden carriers who have earned a dollar by swinging along difficult trails under a load of eighty pounds for three days have been known to refuse coins in favor of horsehairs.

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Photograph by Gilbert H. Grosvenor

HAY FOOT, STRAW FOOT—!

"With a one, two and a three, four, we'll all fall in line," and even "Pinkie" the goat, obeys marching orders, reluctantly straggling along behind. Little girls in bloomers—just plain Americans with no strange customs.

A ROMP WITH JOLLYBOY

Photograph by Charles Marsh

Photograph by A. W. Cutler

A "DONKEYMOBILE" IN SUNNY SICILY

"Call not that man wretched who, whatever ills he suffers, has a child to love."—*Southey.*

A NATIVE SON OF PENNSYLVANIA

Photograph by Harry F. Blanchard

The small boy's preference for a dirty face is well known the world over, but this young coal-miner is exceptionally fortunate in being surrounded with untold quantities of very effective "clean" dirt. The youngster above seems decidedly in his element and supremely happy, apparently with no fears for the future when his "ma" captures him.

Photograph by Donald Mac Leish

"FEEDING THE MOTHERLESS LAMB"

This little Austrian boy, who lives far up in the Tyrolean Alps, has his cosset in fond embrace. It looks like "forcible feeding," but perhaps the supply of milk is to be conserved for another meal and there is difficulty in retrieving the bottle.

BOHEMIA AND THE CZECHS

By Aleš Hrdlička

Curator of Physical Anthropology in the U. S. National Museum

IN THEIR memorable answer to the President of the United States on the conditions under which they would conclude peace with Germany, the Allies announced, as one of these conditions, the liberation of the Czecho-Slovaks from Austria-Hungary.

This introduces on the international forum a most interesting new factor, of which relatively little has been heard during the war and which in consequence has largely escaped, in this country at least, the attention which it deserves.

The same natural law of preservation that rules over individuals rules also over nations—only the strongest survive the struggle for existence. Not the strongest in numbers, nor even physically, but the richest in that healthy virginal life-current which suffers under defeat, but is never crushed; which may be suppressed to the limit, yet wells up again stronger and fresher than ever, the moment the pressure relaxes.

One such nation is surely, it seems, that of the Czechs or Bohemians. A 1,500-year-long life-and-death struggle with the race who surround it from the north, west, and south, with a near-burial within the Austrian Empire for the last three centuries, have failed to destroy the little nation or break its spirit.

As President Wilson has said: "At least two among these many races [of Austria], moreover, are strenuously, restlessly, persistently devoted to independence. No lapse of time, no defeat of hopes, seems sufficient to reconcile the Czechs of Bohemia to incorporation with Austria. Pride of race and the memories of a notable and distinguished history keep them always at odds with the Germans within their gates and with the government set over their heads. They desire at least the same degree of autonomy that has been granted to Hungary." *

*The State, by Woodrow Wilson, revised edition, 1911, page 740.

The Czechs are now more numerous, more accomplished, more patriotic than ever before, and the day is inevitably approaching when the shackles will fall and the nation take its place again at the council of free nations.

WHO ARE THE BOHEMIANS

The Czechs* are the westernmost branch of the Slavs, their name being derived, according to tradition, from that of a noted ancestral chief. The term Bohemia was applied to the country probably during the Roman times and was derived, like that of Bavaria, from the Boii, who for some time before the Christian era occupied or claimed parts of these regions.

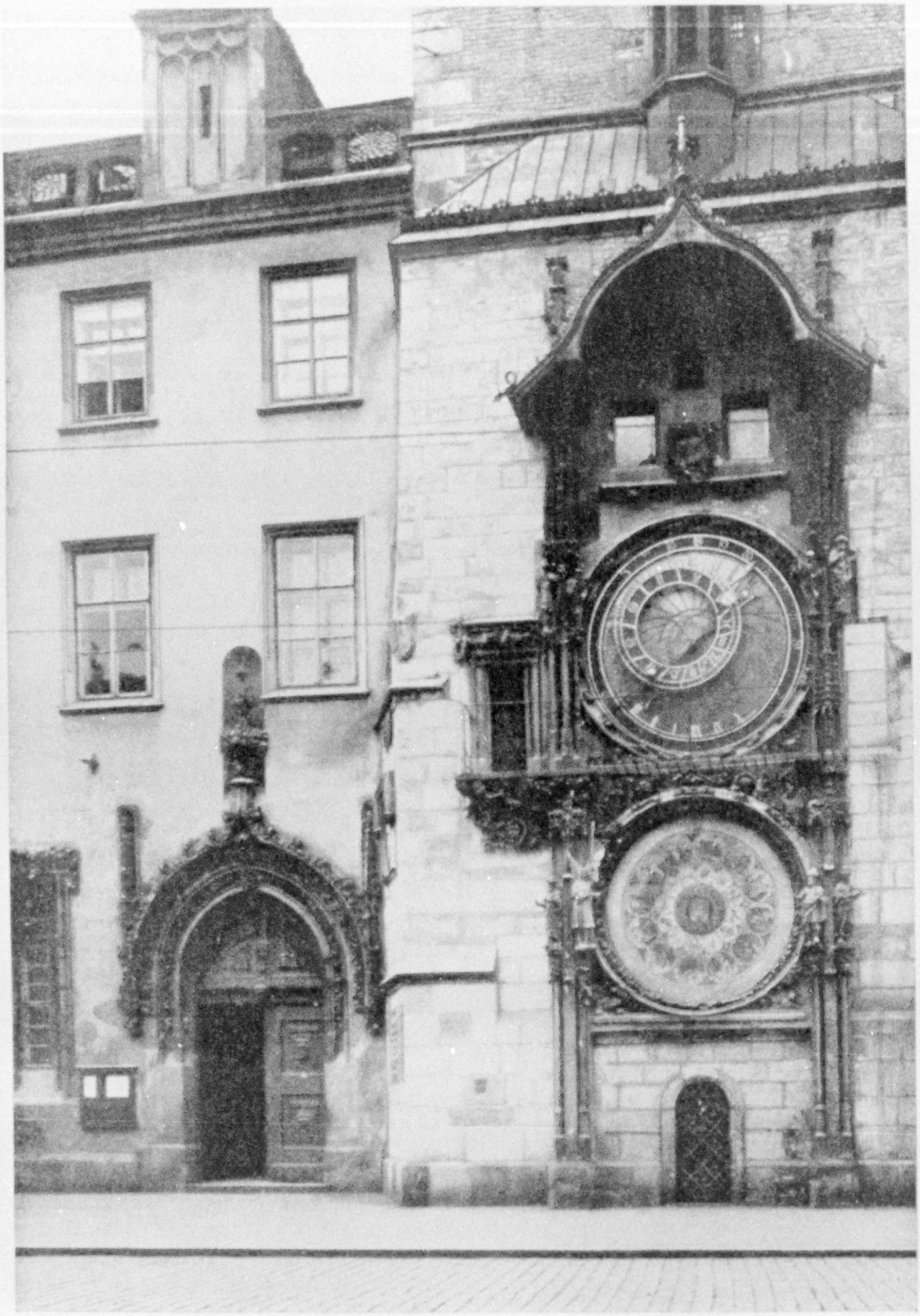
Nature has favored Bohemia perhaps more than any other part of Europe. Its soil is so fertile and climate so favorable that more than half of the country is cultivated and produces richly. In its mountains almost every useful metal and mineral, except salt, is to be found. It is the geographical center of the European continent, equally distant from the Baltic, Adriatic, and North seas, and, though inclosed by mountains, is so easily accessible, because of the valleys of the Danube and the Elbe rivers, that it served, since known in history as the avenue of many armies.

Beside Bohemia, the Czechs occupy Moravia and adjacent territory in Silesia. The Slovaks, who show merely dialectic differences from the Czechs, extend from Moravia eastward over most of northern Hungary.†

The advent of the Czechs is lost in antiquity; it is known, however, that they cremated their dead, and cremation burials in northeastern Bohemia and in Moravia antedate 500 B. C. Their invasions or spread southwestward, so far as re-

*The Cz pronounced like ch in cherry.

† See "Map of Europe," published by the Geographic Magazine, August, 1915.



Photograph from Francis P. Marchant

THE FAMOUS ASTRONOMICAL CLOCK OF THE OLD TOWN HALL OF PRAGUE, DATING FROM 1490 A. D.

In front of the town hall, during the fierce reprisals of Ferdinand II, after the heroic efforts of the Bohemians had been foiled at the battle of White Mountain, forty-eight prominent nobles and citizens of Prague met torture and the block with great fortitude. The astronomical clock at the entrance, with figures of our Lord and the Apostles, is one of the oldest in Europe. Inside the building are the dungeons where the patriots were confined before execution.

corded in tradition or history, were of a peaceful nature, following the desolation and abandonment of the land through wars.

Like all people at a corresponding stage of development, they were subdivided into numerous tribes which settled different parts of the country, and the names of some of these clans, with remnants of dialectic, dress, and other characteristic differences, persist even to this day.

Their documentary history begins in the seventh century, at which time they already extend as far south as the Danube. They are agricultural and pastoral people, of patriarchal organization. Their government is almost republican, under a chief, elected by an assembly of representatives of the main classes of the people. Later this office develops into that of hereditary kings, whose assumption of the throne must nevertheless be in every instance ratified by the national diet. The nation possesses a code of formal supreme laws, and the people are noted for their physical prowess, free spirit, love of poetry, and passionate jealousy of independence.

CHRISTIANITY ACCEPTED

In the ninth century the pagan Czechs accept Christianity, with Slav liturgy, which becomes at once one of their most cherished endowments, as well as a source of much future hostility from Rome. The various tribes become united under the Premysl Dynasty, begun by the national heroine Libussa, with her plowman husband, and lasting in the male line until the first part of the fourteenth century.

Under their kings the Czechs reach an important position among the European nations. They rule, in turn, over large parts of what are now Austrian provinces, and briefly even over Hungary, Poland, and Galicia. But their fortune varies. From the time of Charlemagne they struggle, often for their very existence, with their neighbors, irritated by their presence, their racial diversity, and their riches.

The first recorded war with the Germans dates from 630, when the Frank Dagobert endeavors by force of arms to impose vassalage on the Czechs, but suffers defeat; and from this time on the Bohemian history is replete with records of fighting with the Germans. How the nation escaped annihilation must remain a marvel of history. It is sometimes reduced to almost a German vassal; yet it is never entirely overcome, and rises again and again to assert its individuality and independence.

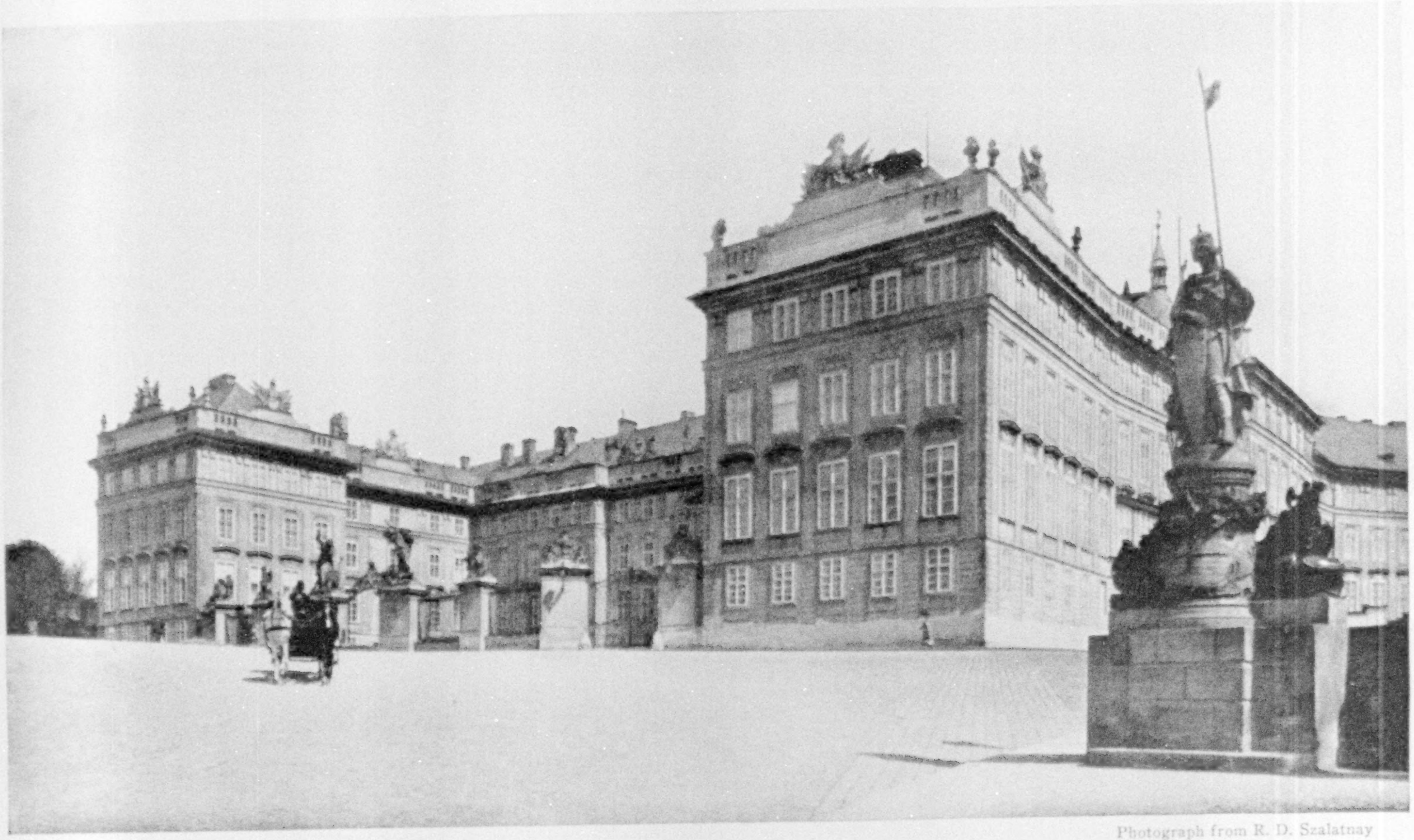
GERMANS COLONIZE BOHEMIA

Some of the Bohemian kings, under political and other influences, permit, and even invite, settlements of Germans on the outskirts of Bohemia. This is the origin of the German population of the country, which has played and still plays such a large part in its politics.

The latter part of the thirteenth century is a most critical period of Bohemia. Under Otakar II, one of its ablest kings, the country has reached the acme of its power. It extends from Saxony to the Adriatic, and Vienna is its second capital. Many of the German principalities are its allies and the king comes near to being called to head the Holy Empire.

But Rudolph of Habsburg is elected to this office, and from the moment of the advent of the house of Habsburg commence Bohemia's greatest misfortunes. The only offense of the Bohemian king is that he is Slav, but that, with the jealousy of his power, the democratic institutions, and the wealth of his country, which contains the richest mines of silver in Europe, is sufficient. Great armies, German and Hungarian, are raised against him; finally he is treacherously slain in battle, his kingdom torn apart, and Bohemia is ravished and reduced almost to a "possession" or a fief of the Empire.

Yet the wound is not mortal, the nation is too strong; it rises again, and within a few decades, under Otakar's son, regains its independence and much of its former power. In 1306, however, the last Bohemian king of the great Premysl family is slain by an assassin, and there begins a long period of dynastic difficulties, which become in time the main cause of Bohemia's downfall.



Photograph from R. D. Szalatnay

THE ROYAL PALACE OF HRADČANY, AT PRAGUE, BOHEMIA

On the 23d of May, 1618, the assembled nobles threw from the windows of the council room two of the councillors who were convicted of treason to the Bohemian cause. This was the initial act of those that led to The Thirty Years' War, which devastated Central Europe, 1618-1648, resulting in the death of millions and almost in the depopulation of Bohemia, Bavaria, Saxony, etc.

A GODSEND TO HIS COUNTRY

The next Bohemian ruler of some note is John of Luxembourg, married to Elizabeth, the last princess of the Premysl house, and killed, fighting for France, at the battle of Crecy, on the Somme (1346). The knightly John does little for Bohemia, but he gives it Karel (Charles IV), his and Elizabeth's son, who proved a god-send to the country.

In Bohemian history he is known as "the father of his country." Under his long, wholesome, patriotic, and peaceful reign (1347-1378) the whole nation revives and strengthens. Independence of the country, except for the honorable connection with the Roman Empire, is fully reëstablished. Education, art, and architecture thrive. The University of Prague is founded (1348) on the basis of the high seat of learning established a century before by Otakar. The medicinal waters of Karlovy Vary (Carlsbad) are discovered and the city of the same name rises on the site; and Prague, as well as other cities, are beautified.

Charles is elected Emperor of the Romans in 1348, and Bohemia stands "first in the world in power, wealth, progress, and liberty." The excellent relations of the country with England culminate in 1382 in the marriage of Richard II with Anne of Bohemia.

THE MARTYRDOM OF JOHN HUSS

But Charles is succeeded by a weak son, and it is not long before Bohemia suffers again from its old enemies.

A great national and religious leader arises in the person of John Huss. But Rome excommunicates John Huss and accuses him of heresy. He is called to report to the Council at Constance and leaves with a written guarantee of safe conduct from Sigismund, the king and emperor, which, however, proves a "scrap of paper." Huss is not permitted to adequately defend the truth, nor to return; he is thrown in prison; his teachings are condemned; and July 6, 1415, he is martyred by being burnt at the stake. The very ashes are ordered collected and cast into the Rhine, lest even they become dangerous.

The shock of the death of Huss and of his fellow-reformer, Jeronym, burnt a little later, fire Bohemia with religious and patriotic zeal and lead to one of the most wonderful chapters in its and the world's history, the Hussite Wars. A military genius arises in Jan Zizka, and after him another in Prokop Holy; a new system of warfare is developed, including the use of some frightful weapons and of movable fortifications formed of armored cars; and for fifteen years wave after wave of armies and crusaders from all Europe, operating under the direction of Rome, Germany, Austria, and Hungary, are broken and destroyed, until religious and national freedom seem more secure.

As an eventual result and after many serious internal difficulties of religious nature, another glorious period follows for Bohemia, both politically and culturally, under the king George Podiebrad (1458-1471). One of their enemies of this period, Pope Pius II (Æneas Sylvius) cannot help but say of them: "The Bohemians have in our times by themselves gained more victories than many other nations have been able to win in all their history." And their many other enemies find but little more against them.

No Inquisition, no evil of humanity, has ever originated in Bohemia. The utmost reproach they receive, outside of the honorable "heretic," is "the hard heads" and "peasants." Few nations can boast of as clean a record.

BOHEMIA'S FATEFUL HOUR

The fateful period for Bohemia comes in the sixteenth century. The people are weakened by wars, by internal religious strifes. A fearful new danger threatens central Europe—the Turks. In 1526 the Bohemian king, Ludvik, is killed in a battle with the Turks, assisting Hungary; and as there is no male descendant, the elective diet at Prague is influenced to offer the crown of Bohemia, under strict guarantees of all its rights, to the husband of Ludvik's daughter, Ferdinand of Habsburg, archduke of Austria.

Hungary, too, joins the union, and the beginning of the eventual empire of

XUM

Photograph by Erdelyi

A SLOVAK BRIDE AND GROOM

Some peasant women wear huge boots like the Wellington pattern, doubtless comfortable and protective against weather, but lacking in the grace traditionally expected in feminine footgear.

Photograph by Edgar K. Frank

POWDER TOWER, AT PRAGUE, BOHEMIA

There was a time when Shakespeare's shipwreck on the shores of Bohemia, described in "Winter's Tale," was a possibility, as the dominions of King Premysl Ottokar were washed by the Baltic and the Adriatic seas. A stone thrown at Prague, it has often been said, carries a fragment of history (see page 165).

Photograph by D. W. Iddings, Keystone View Co.

GENERAL VIEW OF PRAGUE FROM THE PETRIN HILL

Austria has been effected. Continuous wars with the Turks and a terrible plague further weaken the Czechs.

Ferdinand proves a scourge. Religious persecution and then general oppression of Bohemia follow. The freely chosen king becomes tyrant and before long the greatest enemy of Bohemia. Backed by the rest of his dominion, by Rome and Spain, he tramples over the privileges of Bohemia; depletes its man-power as well as treasury; by subterfuge or treachery occupies Prague and other cities, and follows with bloody reprisals and confiscations, which lead to an era of ruthlessness and suffering such as the country has not experienced in its history. The weakened state of the country allows of no effective protest, and of its former allies or friends none are strong enough to offer effective help.

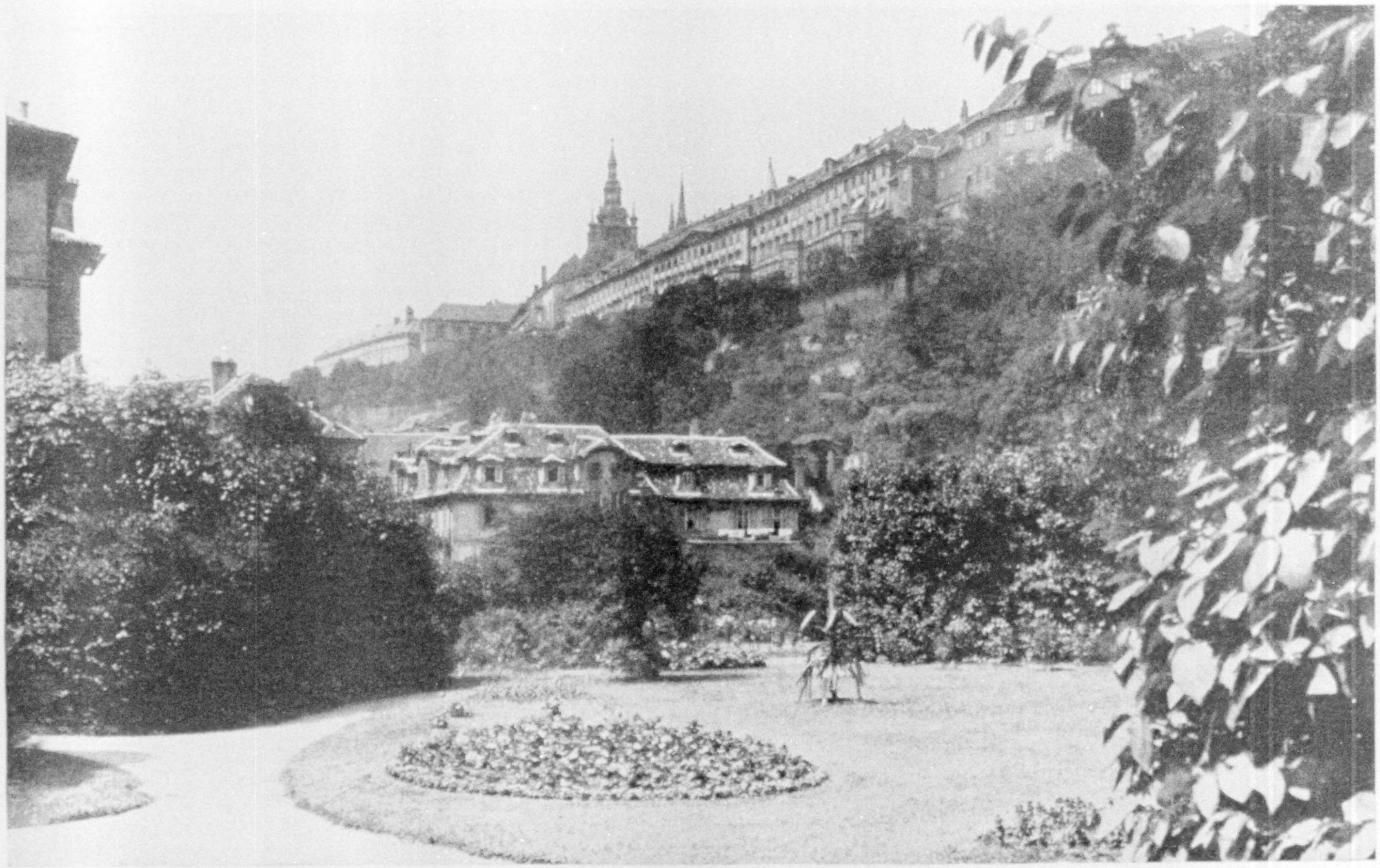
THE TYRANNY OF FERDINAND

Yet even worse was to come from the Habsburgs, the association with whom for Bohemia was from the beginning of the greatest misfortune. During the reign of Ferdinand's immediate successors there is a breathing spell for the Czechs; but in 1616 another Habsburg, Ferdinand II, again under force of circumstances, is elected king of Bohemia, only to prove its greatest tyrant. Within two years the Bohemians are in open revolt, and in another year the king is deposed.

Photograph from R. D. Szalatnay

A BOHEMIAN PEASANT GIRL WORKING ON A PIECE OF EMBROIDERY

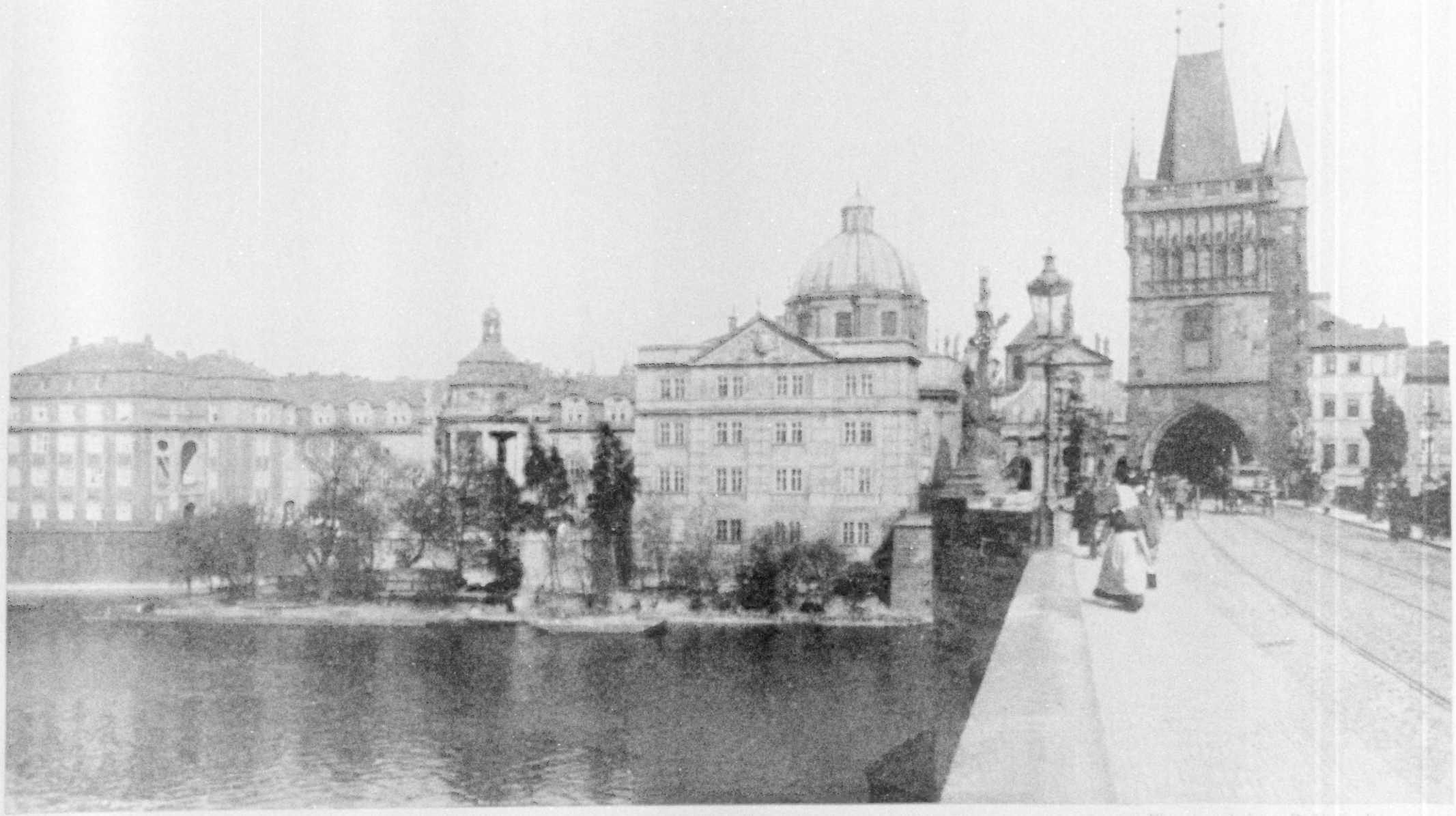
Many of the Czech as well as Slovak embroideries are ethnological documents as well as most interesting works of art



Photograph from Francis P. Marchant

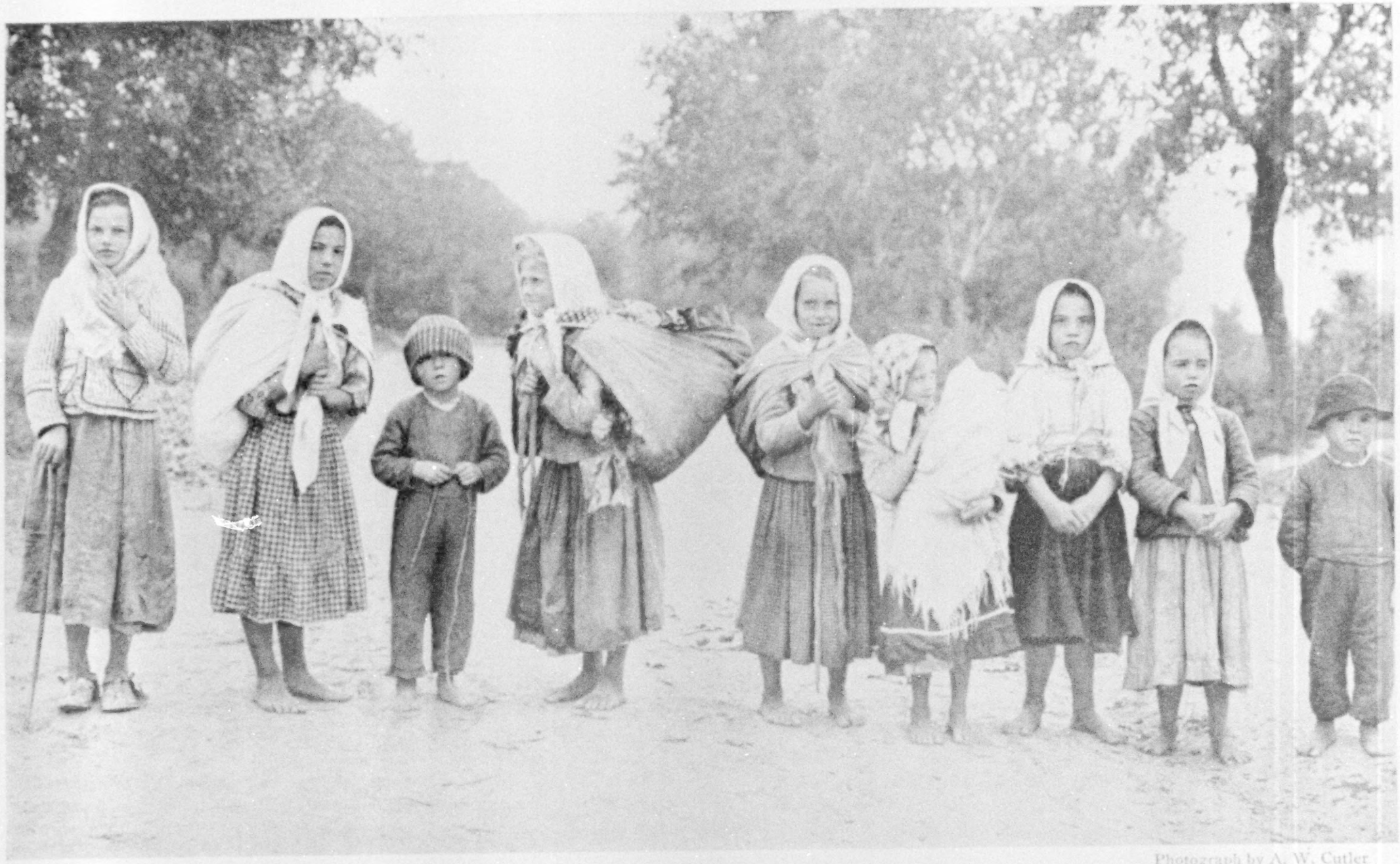
PRAGUE, THE "ROSE OF EUROPE," A CITY OF GARDENS: ONE OF THE PALACE GARDENS ON THE HRADČANY

XUM



Photograph from R. D. Szalatnay

A BRIDGE TOWER IN THE OLD PART OF PRAGUE: THE OLD AND THE MOST MODERN, EACH BEAUTIFUL IN ITS WAY, MEET IN THE OLDER PARTS OF PRAGUE AT EVERY STEP



Photograph by A. W. Cutler

GROUP OF CZECH CHILDREN OF THE POOREST CLASSES: THE LITTLE GIRLS CHEERFULLY HELP THEIR MOTHERS, CARRYING HOME FODDER FOR THE CATTLE AND DOING CHORES

The stranger elected in his place, Frederick of the Palatinate, son-in-law of the King of England, however, proves an incompetent weakling. The Czech armies are disorganized, and November 8, 1620, the main force of 20,000 is defeated at Bila Hora, near Prague, by an army of Germans, Spaniards, Walloons, Poles, Cossacks, and Bavarians.

The following part of the Bohemian history should be read in detail by all its friends—by all friends of humanity. It is a most instructive, though most gruesome, part of the history, not merely of Bohemia, but of Europe, of civilization. In Bohemia itself it is a period of concentrated fiendishness under the banner of religion, and of suffering, of thirty years duration. Beginning with wholesale executions, it progresses to the forced exile of over 30,000 of the best families of the country, with confiscation of their property, and to orgies of destruction of property and life.

Under the leadership of fanatics, every house, every nook, is searched for books and writings, and these are burned in the public squares "to eradicate the devil" of reformation. Rapine reigns, until there is nothing more to burn, nothing to take, and until three-quarters of the population have gone or perished—a dreary monument to the Habsburg dynasty, to the status of mankind in the 17th century.

Had not Germany itself been ravaged by the religious wars thus kindled, this period would probably have been the last of the Czechs; as it was, there were not enough Germans left for colonizing other countries. Yet many came in the course of time, as settlers. German becomes the language of commerce, of courts, of all public transactions; the university is German, and in schools the native tongue finds barely space in the lowest grades.

Books have been burnt, educated patriotic men and women driven from the country, memories perverted. It would surely seem that the light of the nation would now, if ever, become extinct. And it becomes obscured for generations—yet is not extinguished. The roots of the stock prove too strong and healthy.

The people sleep for 150 years, but it is a sleep of rest, not death—a sleep healing wounds and allowing of a slow gathering of new forces.

BOHEMIA REAWAKENED

Toward the end of the eighteenth century the Czech language is almost wholly that of the untutored peasant. But the time of quickening approaches. First one cell, one nerve, one limb of the prostrate body revives; then others. The history of the nation is resurrected and proves an elixir of life; to learn it is to a Czech enough for a complete awakening. But the awakening period becomes one of constant struggle against all the old forces that would keep him down; yet step by step he advances, over prisons and gallows.

Literature, science, art arise again; journalism begins to develop. The university is regained; Prague, the "mother" of Bohemian cities, is regained, and others follow. Education reaches a higher level ultimately than anywhere else in Austria. A great national society of Sokols ("falcons") is formed to elevate the people physically, intellectually, and morally.

Bohemian literature, music, art, science come against all obstacles to occupy again an honorable position among those of other nations.

Agricultural and technical training progresses until the country is once more the richest part of the empire. Finally journalism has developed until, just before the war, there are hundreds of Czech periodicals. The Czech language is again heard in the courts, in high circles, in the Austrian Reichstag itself; and, though still crippled, there is again a Bohemian Diet.

Where after the Thirty Years' War there were but a few hundred thousands of Czechs left, there are now in Bohemia, Moravia, and Silesia alone seven millions; besides which there are over two million Slovaks in the adjacent area under Hungary.

Such is the very brief and imperfect abstract of the history of the Czech people, who see once more before them the dawn of liberty which they so long cherished.

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WHAT HAVE THE BOHEMIANS ACCOMPLISHED AS A NATIONALITY?

It may be well to quote on this subject a paragraph from an American author, Robert H. Vickers (History of Bohemia, 8°, Chicago, 1894, p. 319):* "The fixed rights, the firm institutions, and the unfailing gallantry of Bohemia during eight hundred years had constituted a strong barrier against the anarchy of the darkest ages. The manly independence and the solicitude for individual political rights always exhibited by the Bohemian people have rendered them the teachers of nations; and their principles and parliamentary constitution have gradually penetrated into every country under heaven.

"They protected and preserved the rights of men during long ages when those rights were elsewhere unknown or trampled down. Bohemia has been the birthplace and the shelter of the modern politics of freedom."

But Bohemia has also been for centuries the culture center of central Europe. Its university, founded in 1348, at once for the Czechs, Poles, and Germans, not only antedated all those in Germany and Austria, but up to the Hussite wars was, with that of Paris, the most important of the continent. In 1409, when the German contingent of the university, failing in its efforts at controlling the institution, left Prague to found a true German university at Leipzig, the estimates of the number of students, instructors, and attendants who departed average over 10,000.

WYCLIFFE ENCOURAGES THE CZECHS

Sigismund, the emperor and deposed king of Bohemia, in writing of it, in 1416, to the Council of Constance, says: "That splendid University of Prague was counted among the rarest jewels of our realm. . . . Into it flowed, from all parts of Germany, youths and men of mature years alike, through love of virtue and study, who, seeking the treasures of knowledge and philosophy, found them there in abundance."

Last, but not least, Bohemia led in the great struggle for freedom of thought, religious reformation. Encouraged by the writings of Wycliffe, in England, and by such meager sympathy from continental Europe as they could obtain in those dark times, the Czech puritans, regardless of the dire consequences which they knew must follow, rose in open, bold opposition to the intellectual slavery in which nearly the whole of Europe was then held. They paid for this with their blood, and almost with the existence of the nation; but Luther and a thousand other reformers arose in other lands to continue on the road of liberation.

For a small nation, not without the usual human faults, and distracted by unending struggles for its very existence, the above contributions to the world during the dark age of its rising civilization, would seem sufficient for an honorable place in history.

THE CHARACTERISTICS OF THE CZECHS

As to the modern achievements of the nation, they follow largely in the footsteps of the old. Notwithstanding the most bitter struggle for every right of their own, the Czechs have extended a helpful hand to all other branches of the Slavs, in whose intellectual advance and solidarity they see the best guarantee of a peaceful future. They have extended their great organization Sokol, which stands for national discipline, with physical and mental soundness, among all the Slavic nations, and they are sending freely their teachers over the Slav world, and this while still under the Habsburgs.

To attempt to define the characteristics of a whole people is a matter of difficulty and serious responsibility even for one descended from and well acquainted with that people. Moreover, under modern conditions of intercourse of men and nations, with the inevitable admixtures of blood, the characteristics of individual groups or strains of the race tend to become weaker and obscured.

Thus the Czech of today is not wholly the Czech of the fifteenth century, and to a casual observer may appear to differ but little from his neighbors. Yet he differs, and under modern polish and the more or less perceptible effects of cen-

*See also W. S. Monroe, Bohemia and the Czechs, Boston, 1910.

Photograph from Francis P. Marchant

THE TÝN CHURCH OF PRAGUE (FORMERLY HUSSITE CHURCH)

Prague is also known as "the city of hundred towers (or steeples)"; but the towers are now lifeless; their great sonorous bells have been confiscated for Austrian cannon

Photograph by A. W. Cutler

SLOVAKS AT POSTYEN ATTENDING A CELEBRATION OF MASS ON SUNDAY MORNING

There being no room in the church, these devout people take part in the services outside; even when the ground is wet and muddy they kneel thereon

turies of oppression, is still in a large measure the Czech of the old.

He is kind and with a stock of native humor. He is musical, loves songs, poetry, art, nature, fellowship, the other sex. He is an intent thinker and restless seeker of truth, of learning, but no apt schemer. He is ambitious, and covetous of freedom in the broadest sense, but tendencies to domineering, oppression, power by force over others, are foreign to his nature. He ardently searches for God and is inclined to be deeply religious, but is impatient of dogma, as of all other undue restraint.

He may be opinionated, stubborn, but is happy to accept facts and recognize true superiority. He is easily hurt and does not forget the injury; will fight, but is not lastingly revengeful or vicious. He is not cold, calculating, thin-lipped, nor again as inflammable as the Pole or the southern Slav, but is sympathetic and full of trust, and through this often open to imposition.

His endurance and bravery in war for a cause which he approved were proverbial, as was also his hospitality in peace.

He is often highly capable in languages, science, literary and technical education, and is inventive, as well as industrial, but not commercial. Imaginative, artistic, creative, rather than frigidly practical. Inclined at times to melancholy, brooding, pessimism, he is yet deep at heart for ever buoyant, optimistic, hopeful—hopeful not of possessions or power, but of human happiness, and of the freedom and future golden age of not merely his own, but all people.

COMENIUS—ONE OF THE GREAT MEN OF ALL TIME

Every nation has its local heroes, local geniuses, but these mean little for the rest of the world. Bohemia had a due share of such among its kings, reformers, generals, and especially writers; but it also gave the world many a son whose work was of importance for humanity in general and whose fame is international. Not a few of these were exiles or emigrants from the country of their birth, who, having settled permanently abroad, are only too readily credited to the country that gave them asylum. Germany and Austria, as the nearest geographically and with a language that the Czech youth were forced to learn, received most of such accessions; but some reached Holland, France, England, and even America.

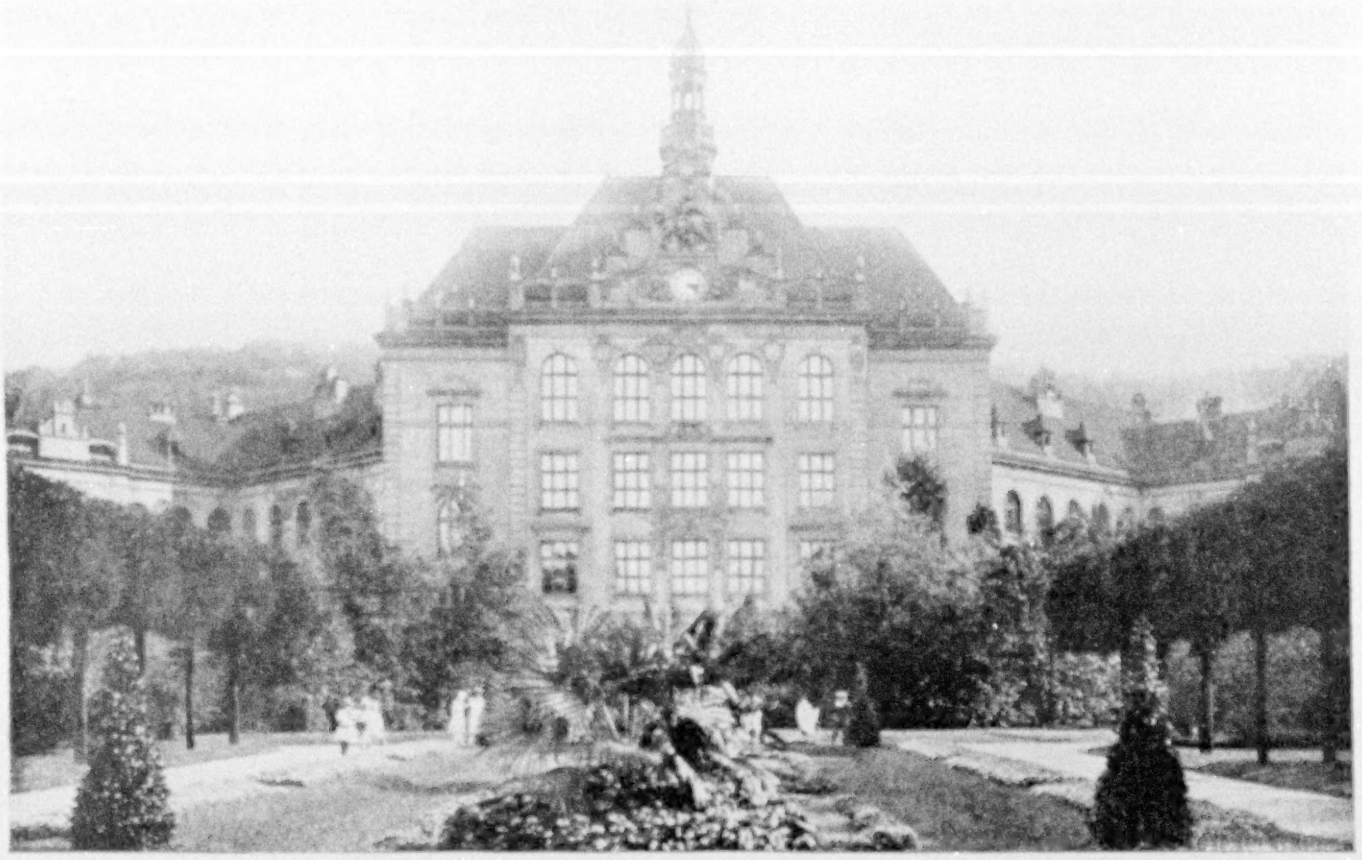
One of the most honored names in the universal history of pedagogy is that of the Czech patriot and exile, Jan Amos Komensky, or Comenius (1592-1671), the last bishop of the Bohemian Brethren.

Driven away, in 1624, after all his books and manuscripts were taken and burnt, he settles for a time in Poland, then in Holland. His pedagogical writings constitute the foundations of modern education. His best-known works in this connection are *Janua linguarum reserata* (1631), Labyrinth of the World (1631), *Opera didactica magna* (1657), and *Orbis pictus* (1658). This latter work is the first children's picture-book. He condemns the system of mere memorizing in school, then in use, and urges that the scholar be taught to think. Teaching should be, as far as possible, demonstrative, directed to nature, and develop habits of individual observation.

All children, without exception—rich or poor, noble or common—should receive schooling, and all should learn to the limits of their possibilities. "They should learn to observe all things of importance, to reflect on the cause of their being as they are, and on their interrelations and utility; for the children are destined to be not merely spectators in this world, but active participants."

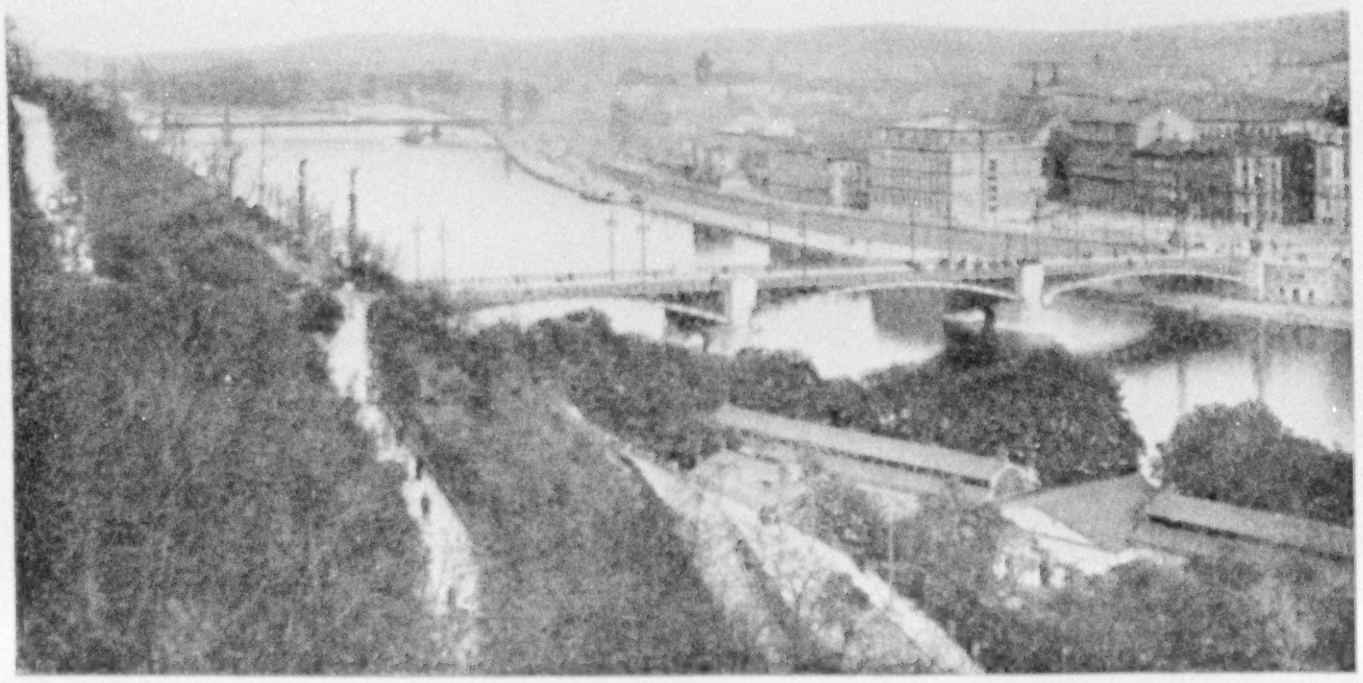
"Languages should be taught, like the mother tongue, by conversation on ordinary topics; pictures, object lessons, should be used; teaching should go hand in hand with a happy life. In his course he included singing, economy, politics, world history, geography, and the arts and handicrafts. He was one of the first to advocate teaching science in schools."

The child should "learn to do by doing." Education should be made pleasant; the parents should be friends of the teachers; the school-room should be spacious, and each school should have a good place for play and recreation.



A PUBLIC SCHOOL IN PRAGUE, BOHEMIA

The Czech philosopher Comenius, who lived during the seventeenth century, the bloodiest of all centuries excepting our own, urged that all children, rich and poor, should be taught to read and write. His teachings were in part responsible for the compulsory education of all American children early enforced by American colonists (see pages 179 and 184).



Photographs from R. D. Szalatnay

GENERAL VIEW OF THE OLD CITY OF PRAGUE AND THE RIVER VLTAVA, WHICH THE COMPOSER DVORAK IMMORTALIZED IN A MUSICAL POEM

Photograph from Francis P. Marchant

THE HUNDRED-TOWERED PRAGUE

Besides Prague, other notable cities of Bohemia and Moravia are: Carlsbad, whose healthful springs, magnificent pine forests, and picturesque setting have delighted thousands of Americans; Pilsen (Plzen), Budweis (Budějovice), Brünn (Brno), and Olomoric.

Such were, during one of the darkest periods of European history and when schooling was so debased, the notions of this great exile whose life-long desire was to return to Bohemia; he was not permitted to do so and died at Amsterdam, Holland, predicting the fall of the Habsburgs and the future freedom of his country.

For a century and a half following the *débacle* of Bila Hora (see page 175) the exhausted, ravaged nation produces no men of more than local reputation; but in 1773 there is some reform of schools, and the development of a whole series of eminent men, not a few of whom reach international reputation, promptly follows.

SOME OF THE MEN BOHEMIA HAS PRODUCED IN RECENT TIMES

The year 1798 sees the birth of the greatest Bohemian historian, František Palacký (1798-1876). Writing in Czech, as well as German, he edits the Bohemian Archives, publishes what has been saved

Photograph by Edgar K. Frank

THE CHARLES IV BRIDGE AT PRAGUE, BOHEMIA

The buttresses of the bridge are adorned with twenty-eight statues and groups of saints. A slab of marble on the bridge between the sixth and seventh pillars marks the spot where St. John Nepomuc, the patron saint of Bohemia, is said to have been flung from the bridge by order of Wenceslaus IV for refusing to betray what the Empress had confided to him in the confessional. The bridge is 1,650 feet long, has 16 arches, and was built 550 years ago.

in Europe from the old Bohemian historians. His historical works, as well as his statesmanship and other important activities, bring him the name of the "father of the nation." He is regarded as the foremost Bohemian of the nineteenth century; and his monument in Prague is one of the most remarkable works of art in Europe.

In the line of invention this earlier period gives Prokop Diviš (1696-1765), the discoverer of the lightning rod (1754), and Josef Ressl (1793-1857), the inventor of the screw propeller.

In science and medicine there stand foremost Jan Evang. Purkinje (1787-1869), founder of the first physiological institute in Germany and father of experimental physiology; Karel Rokytanski (1804-1878), the most deserving pioneer of pathological anatomy; Josef Skoda (1805-1881), the founder of modern methods of physical diagnosis of disease; Edward Albert (1841-1912), the great surgeon of the Vienna University; Ant. Frič (1832-1913), the noted paleontologist.

BOHEMIAN COMPOSERS AND MUSICIANS

The Bohemian pantheon is particularly rich in composers and musicians. Of the former one of the best known to the world is Bedřich Smetana (1824-1884), the founder of the modern school of Bohemian music and the composer, among many other exquisite works, of the "Prodaná Nevěsta" (The Bartered Bride), a national opera which has appeared repeatedly within the last few years at the Metropolitan Opera House, New York. The great cycle, "My Country," with the "Libuše" and "Dalibor," are a few other of his compositions.

Anton Dvořák (1841-1904) was admittedly the greatest composer of his time. His "Slavonic Dances" and his symphonies are known everywhere. Invited to this country, he was for several years director of the National Conservatory of Music in New York City, during which time he made an effort to develop purely American music based on native, and especially Indian, motives.

Among musicians the name of Jan Kubelik (1880-....) and Kocian are too well known in this country to need any introduction, and the same is true of the operatic stars Slezák and Emmy Destin.

Of poets the two greatest are Svatopluk Čech (1846-1910) and Jaroslav Vrchlický (1853-1912). They are not as well known in foreign lands as the Bohemian composers and musicians only because of the almost unsurmountable difficulties which attend the translation of their works. In novelists and other writers, of both sexes, Bohemia is rich, but as yet translations of their works are few in number and they remain comparatively unknown to the world at large.

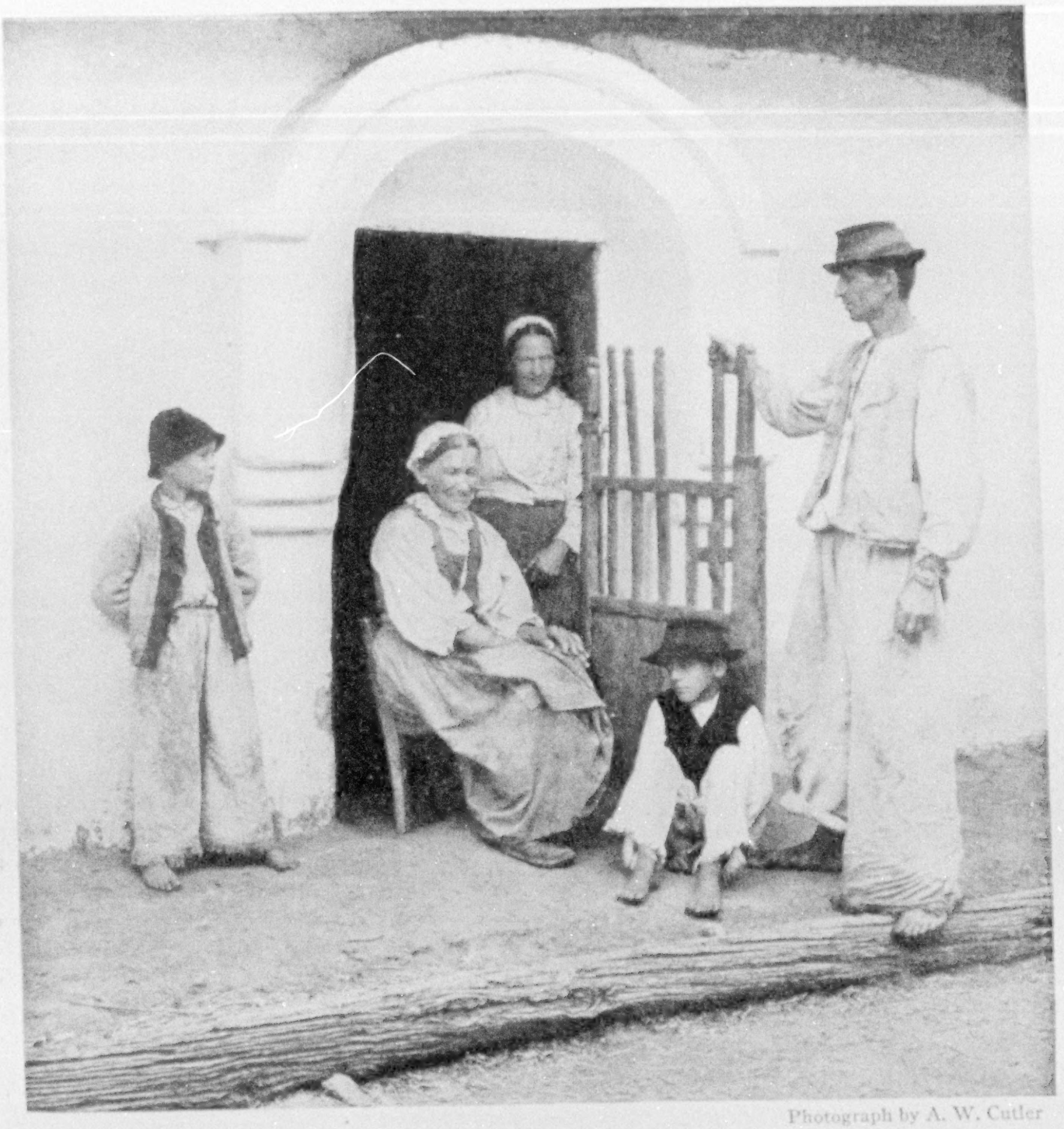
The above brief notes, which do but meager justice to the subject, would be incomplete without a brief reference to a few of the most noted Bohemian journalists and statesmen of more than local renown. Of the former at least two need to be mentioned—Karel Havlíček (1821-1856), martyred by Austria, and Julius Gréger (1831-1896), the founder of the Národní Listy, the most influential of Bohemian journals.

The most prominent modern *statesmen* of Bohemia are Karel Kramář (1860-....), since the beginning of the war in Austrian prison, and Thos. G. Masaryk (1850-....), since the war a fugitive from Austrian persecution, now at Oxford University, England. The sister of the latter is well known in this country and her recent liberation from a prison in Vienna was in no small measure due to the intervention of her American friends.*

BOHEMIANS IN THE UNITED STATES

It seems a far cry from Bohemia to this country, yet their relations are both of some import and ancient. The man who made the first maps of Maryland and Virginia, introduced the cultivation of tobacco into the latter State, and for these and other services became the lord of the "Bohemia Manor" in Maryland, was the

*Those who may be more closely interested in the more recent and still living men of note of Bohemia should consult Narodni (National) Album, Prague, 1899, which contains over 1,300 portraits, with biographies.



Photograph by A. W. Cutler

A SLOVAK PEASANT FAMILY IN EVERY-DAY DRESS

Note the Norman arch; it is typical of Slovak homes. Note the fringe at bottom of trousers, which are pretty wide when compared with English or American trousers, but positively skin-tight in comparison with the trousers of a Hungarian peasant. They are a highly respectable, hard-working community and may be seen in large numbers throughout the Vag Valley.

exiled Bohemian Jan Heřman, as were the parents of Philip, lord of the Philip's Manor on the Hudson, one of whose descendants came so near becoming the bride of Washington. Not a few of the Czechs came into this country with the Moravian brethren; and Comenius (see page 179) was once invited to become the President of Harvard University.*

The immigration of the Czechs into this country dates very largely from near the middle of the last century, when, following the revolutionary movements of 1848, from which Bohemia was not spared, persecution drove many into foreign lands. During our Civil War many Czechs fought bravely in the armies of the North.

The total number of Czechs now living, exclusive of Slovaks, is estimated at 9,000,000, of whom 7,000,000 are under Austria-Hungary; in the United States

*"The Bohemians," E. F. Chase, N. Y., 1914.

Photograph by Erdelyi

YOUNG SLOVAK BEAUX

In the background are highland cottages. Note the embroidered trousers and shoes.

there are about 500,000, of whom one-half were born in this country.

They are found in practically every State of the Union, though the majority live in the Central States. Many are independent farmers or artisans, and it is only fair to say that they are everywhere regarded as desirable citizens. They take active part in the political and public life of the country. Two United States Congressmen, a number of members of State legislatures, and numerous other public officials are of Czech descent.

DISTINGUISHED CZECH-AMERICANS

In American science the names of men like Novy (Ann Arbor), Shimek (Iowa University), or Zeleny (University of Minnesota) are well known and honored, while the number of university students

Photograph by A. W. Cutler

SLOVAK MOTHER AND CHILD, SHOWING QUAINT CRADLES USED

Granny, who stands behind, is wearing a very comfortable coat, made of sheepskin; the wool is inside. It fits well and looks well, and granny knows it.

of Bohemian parentage is exemplified by the "Federation of Komensky (Comenius) Educational Clubs," with its many branches, and by the fact that the Bohemian language is now taught at the University of Nebraska and several other institutions of higher learning.

The true Bohemian here and elsewhere, as can easily be understood, has nothing but the bitterest feelings toward Austria, the stranger and usurper, who, since the war started, is once more in the full swing of his persecutions. The Czech sympathies are wholly with Belgium, Russia, Serbia, France, and Great Britain. And what is true of the Czechs is also true of the Slovaks, who suffer even more under Magyar oppression.

The Czechs and Slovaks in Austria-Hungary fight only under compulsion; their unwilling regiments were decimated; their political and national leaders fill the Austrian and Hungarian prisons. Thousands of Bohemian and Slovak volunteers are fighting enthusiastically under the banners of France and Great Britain, and there are whole regiments of them attached to the Russian army.

Here in the United States the very word of Austria sounds strange and unnatural to the Bohemian. They have found here their permanent home, and while hoping and even working for the eventual freedom of Bohemia, and proud of their descent from the Czech people, they are, citizens or not yet citizens, all loyal Americans.

FRAUDULENT SOLICITORS

THE ATTENTION OF THE MEMBERS of the National Geographic Society is invited to the fact that we are receiving reports of the activities of many fraudulent agents who are operating in various sections of the country, representing themselves to be authorized "agents" of the National Geographic Society. We are advised that these persons solicit membership in the Society and subscription to the Magazine at a reduced price.

Many complaints have been received from persons who have paid in advance for maps and other publications of the Society which, of course, they have never received, since no knowledge of the transactions ever came to us.

The National Geographic Society has no authorized agents and employs no solicitors in the field. Therefore it is suggested that members of the Society send direct to the Society all orders, remittances, or communications of any kind.

Should you hear of any person claiming to be an authorized representative of the Society and soliciting orders, you will render a great service if you will immediately telegraph the facts to the National Geographic Society, Washington, D. C.

XUM

A CITIZEN OF BAGDAD

For descriptions of Mesopotamia and Bagdad, the City of the Caliphs, recently captured by the British forces, see "The Cradle of Civilization," by James Baikie, and "Pushing Back History's Horizon," by Albert T. Clay, NATIONAL GEOGRAPHIC MAGAZINE, February, 1916; and "Where Adam and Eve Lived" and "Mystic Nedjef," by Margaret and Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, December, 1914.

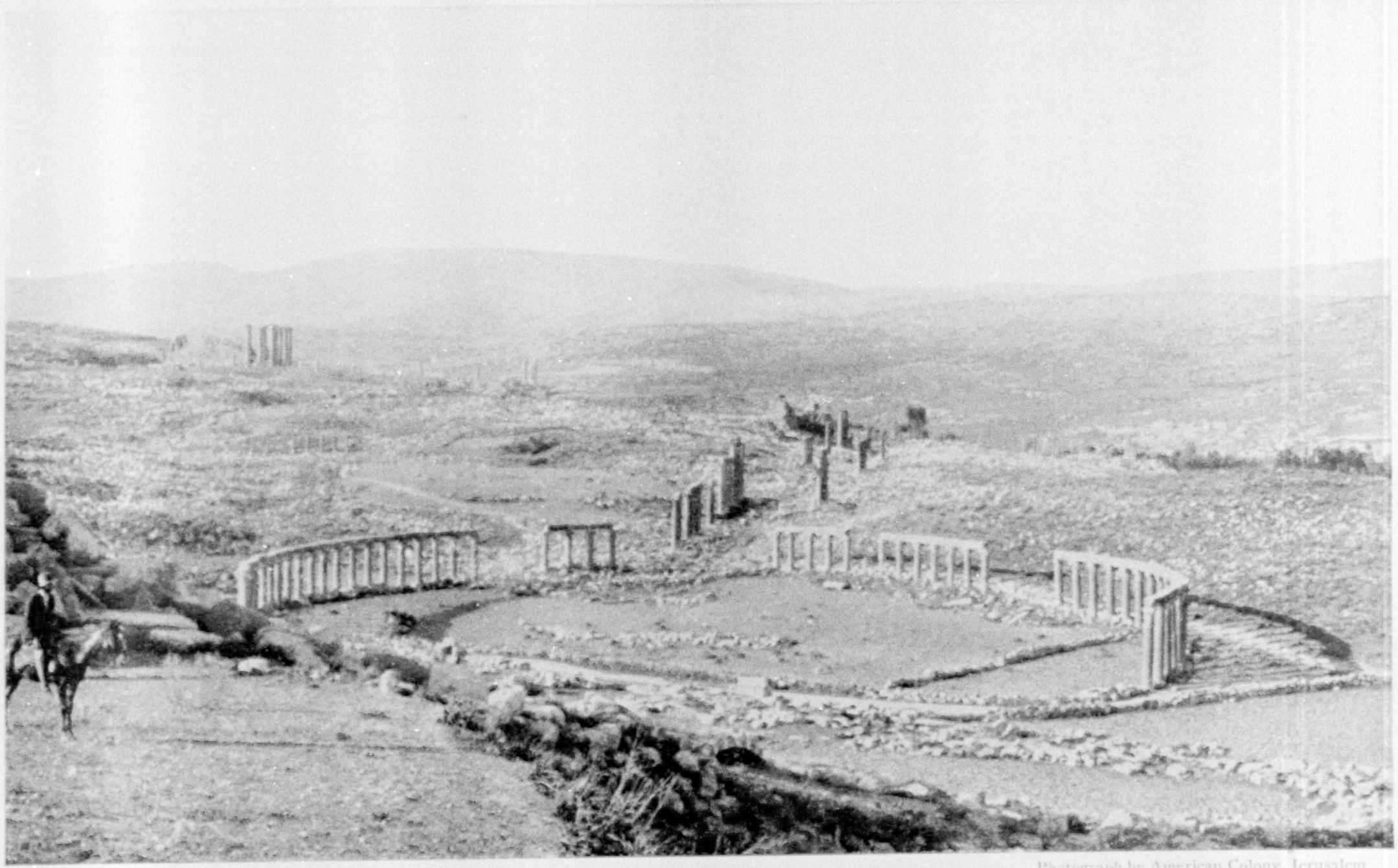
Photograph from George L. Robinson

ABRAHAM'S OAK, NEAR HEBRON, PRESERVED BY THE RUSSIAN ORTHODOX CHURCH

Abraham, wandering slowly with his possessions of cattle, sheep, and goats, made his headquarters for a long time at the oak of Mamre. Here it was that Sarah died, and Abraham went to Ephron, the Hittite, and bargained for the cave of Machpelah for a burial place.

For articles on the Holy Land in the NATIONAL GEOGRAPHIC MAGAZINE, see "From Jerusalem to Aleppo," January, 1913; "Village Life in the Holy Land," March, 1914; "Jerusalem's Locust Plague," December, 1915—all by John D. Whiting.

XUM

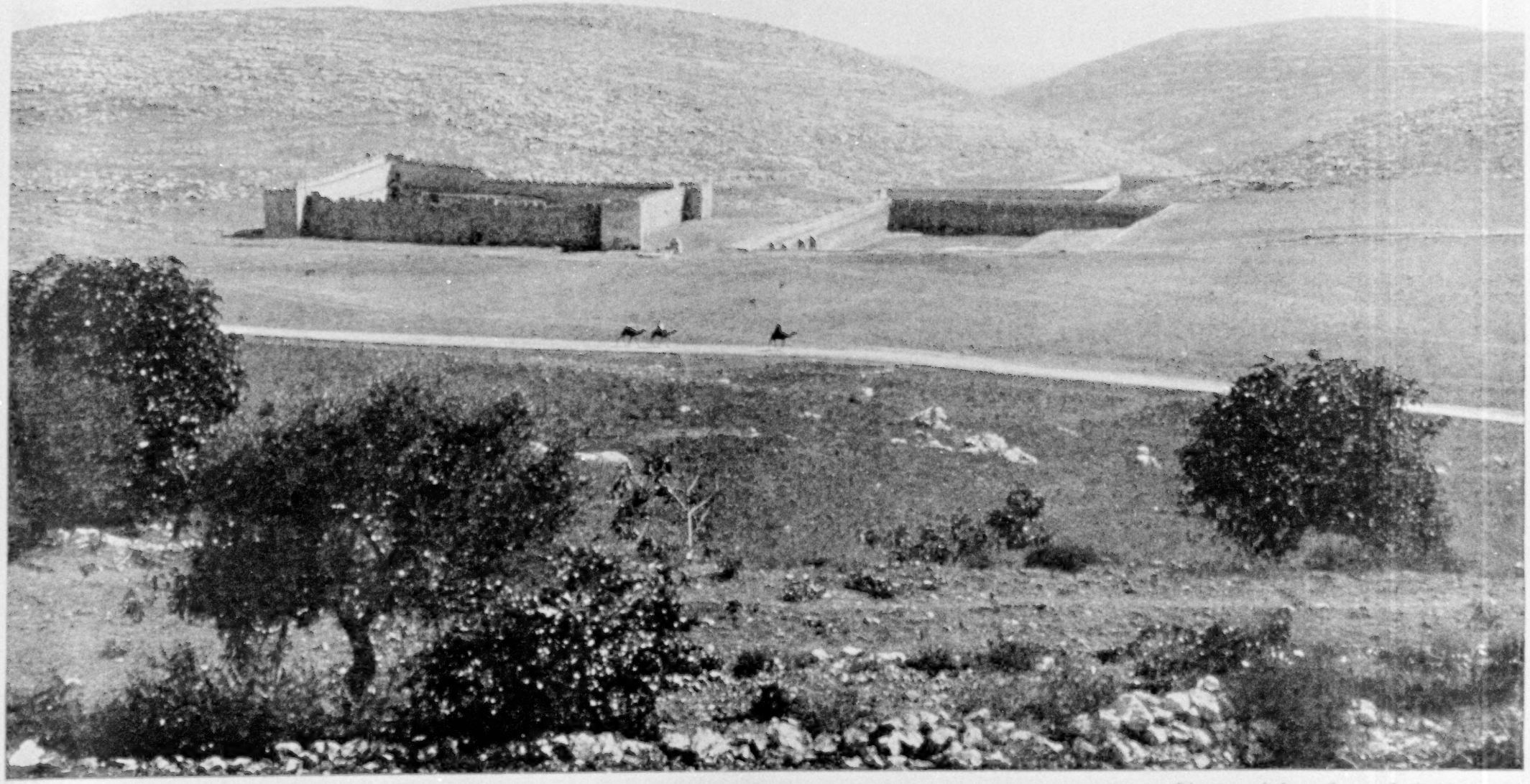


Photograph by American Colony, Jerusalem

THE RUINS OF JERASH, SITUATED ABOUT EIGHTY MILES SOUTHWEST OF DAMASCUS

Jerash is a city of stupendous ruins, in size and importance second only to Palmyra, and in beauty of architecture surpassed only by Baalbec. It is the world's best example of the ancient Grecian city. Here was reared every structure that made life attractive to the Greek—the colonnaded street, the splendid forum, the beautiful temple, and the magnificent theater. According to Pliny, Jerash was one of the original ten cities which formed the Decapolis.

XUM



Photograph from George L. Robinson

ANCIENT KHAN, OR PUBLIC SHELTER, AND SOLOMON'S POOLS ON THE WAY TO HEBRON

Three perennial springs at the head of the great valley of the Wady Artas furnish water for the Pools of Solomon, while two aqueducts bring a further supply from distant springs, one of them nearly fifty miles away. The upper spring of the group is said to be the sealed fountain of Solomon's Song.

Photograph by American Colony, Jerusalem

A TANNERY IN THE CITY OF HEBRON, NEAR JERUSALEM, OCCUPIED BY THE BRITISH FORCES FROM EGYPT

Hebron claims to be the oldest city in the world. The Book of Numbers declares that it was built seven years before Zoan, and Zoan was Tanis, the chief town of the Egyptian delta in the second millennium before Christ. According to the Bible, Hebron's ancient name was Kirjath-Arba. The Book of Joshua says that its inhabitants were a race of giants. Hebron is noted for its tanneries engaged in making skins for carrying water.

This intensely human picture stands for all that is best in music

It is a picture with a message—a living message of absolute fidelity.

"His Master's Voice" is inseparably associated with the highest attainments in the musical art; with the exquisite renditions of the world's greatest artists; with the world's best music in the home.

It is the exclusive trademark of the Victor Company. It identifies every genuine Victrola and Victor Record.

There are Victor dealers everywhere, and they will gladly demonstrate the different styles of the Victor and Victrola—$10 to $400—and play any music you wish to hear.

Victor Talking Machine Co., Camden, N. J., U. S. A.
Berliner Gramophone Co., Montreal, Canadian Distributors

Important warning. Victor Records can be safely and satisfactorily played only with *Victor Needles or Tungstone Stylus* on Victors or Victrolas. Victor Records cannot be safely played on machines with jeweled or other reproducing points.

New Victor Records demonstrated at all dealers on the 28th of each month

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Beautiful Floors

You want rich, lustrous floors. You want them smooth and easily kept clean. You want them to stay beautiful and to last.

Then use good varnish. Good varnish always looks well. Poor varnish looks about the same as good varnish when first put on, but soon begins to look shabby. Good varnish is cheap—poor varnish is dear.

Murphy Floor Varnish

"the varnish that lasts longest"

beautifully brings out the grain of your wood, protects it and lasts and lasts. It gives you beautiful well-kept floors and saves the trouble and expense of frequent refinishing.

Other Murphy finishes for beautifying the home are:

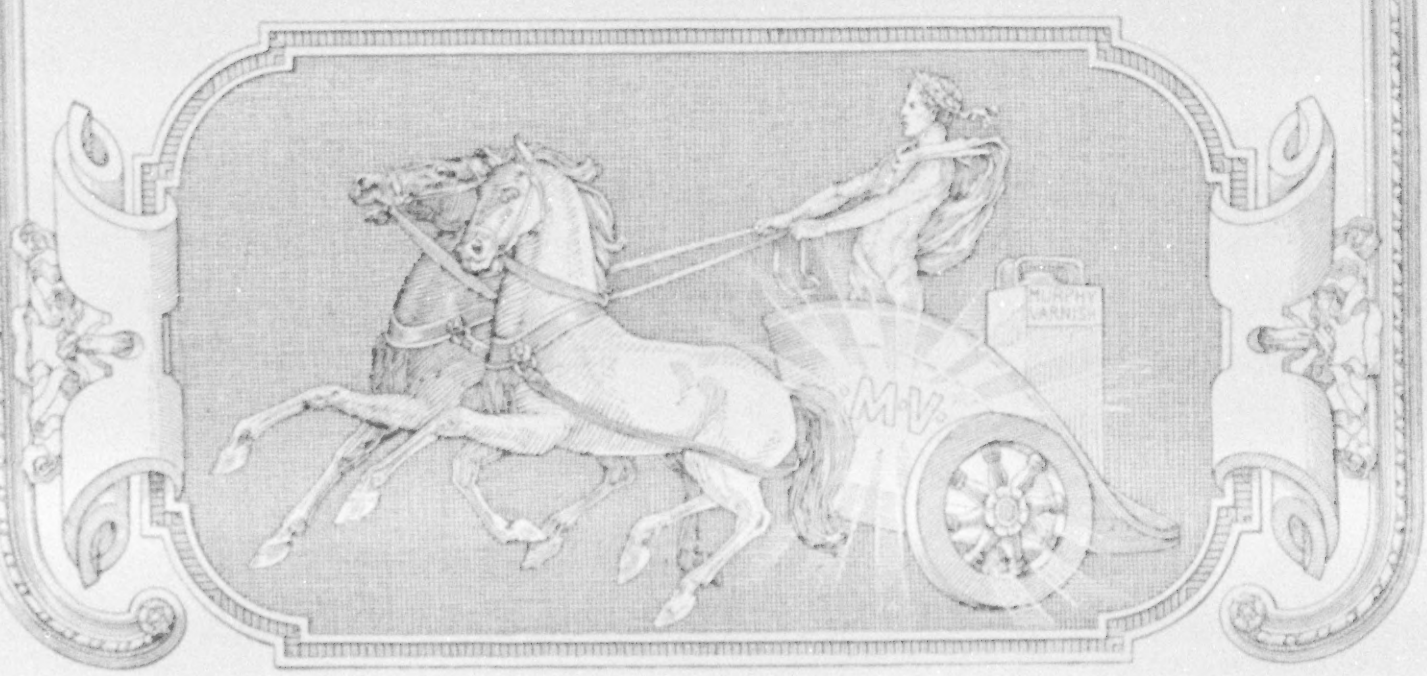
Murphy Transparent Interior
Murphy Transparent Exterior
Murphy Univernish
Murphy White Enamel

Ask your painter or dealer for them. Also, send for our handsome book "Making a House into a Home".

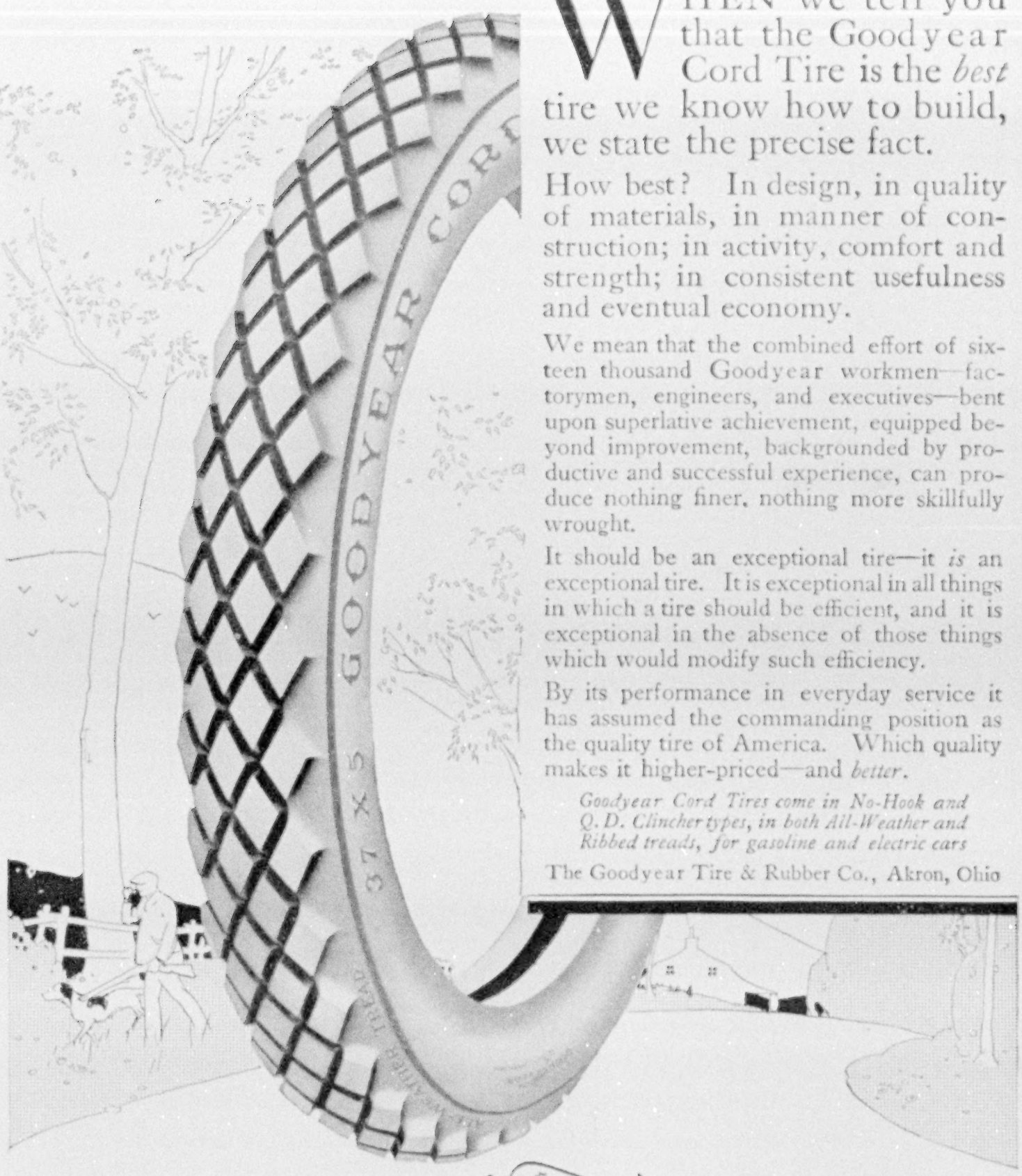
Murphy Varnish Company

Franklin Murphy, jr., President

Newark New Jersey Chicago Illinois



A Road in the Berkshire Hills, Massachusetts



WHEN we tell you that the Goodyear Cord Tire is the *best* tire we know how to build, we state the precise fact.

How best? In design, in quality of materials, in manner of construction; in activity, comfort and strength; in consistent usefulness and eventual economy.

We mean that the combined effort of sixteen thousand Goodyear workmen—factorymen, engineers, and executives—bent upon superlative achievement, equipped beyond improvement, backgrounded by productive and successful experience, can produce nothing finer, nothing more skillfully wrought.

It should be an exceptional tire—it *is* an exceptional tire. It is exceptional in all things in which a tire should be efficient, and it is exceptional in the absence of those things which would modify such efficiency.

By its performance in everyday service it has assumed the commanding position as the quality tire of America. Which quality makes it higher-priced—and *better*.

Goodyear Cord Tires come in No-Hook and Q. D. Clincher types, in both All-Weather and Ribbed treads, for gasoline and electric cars

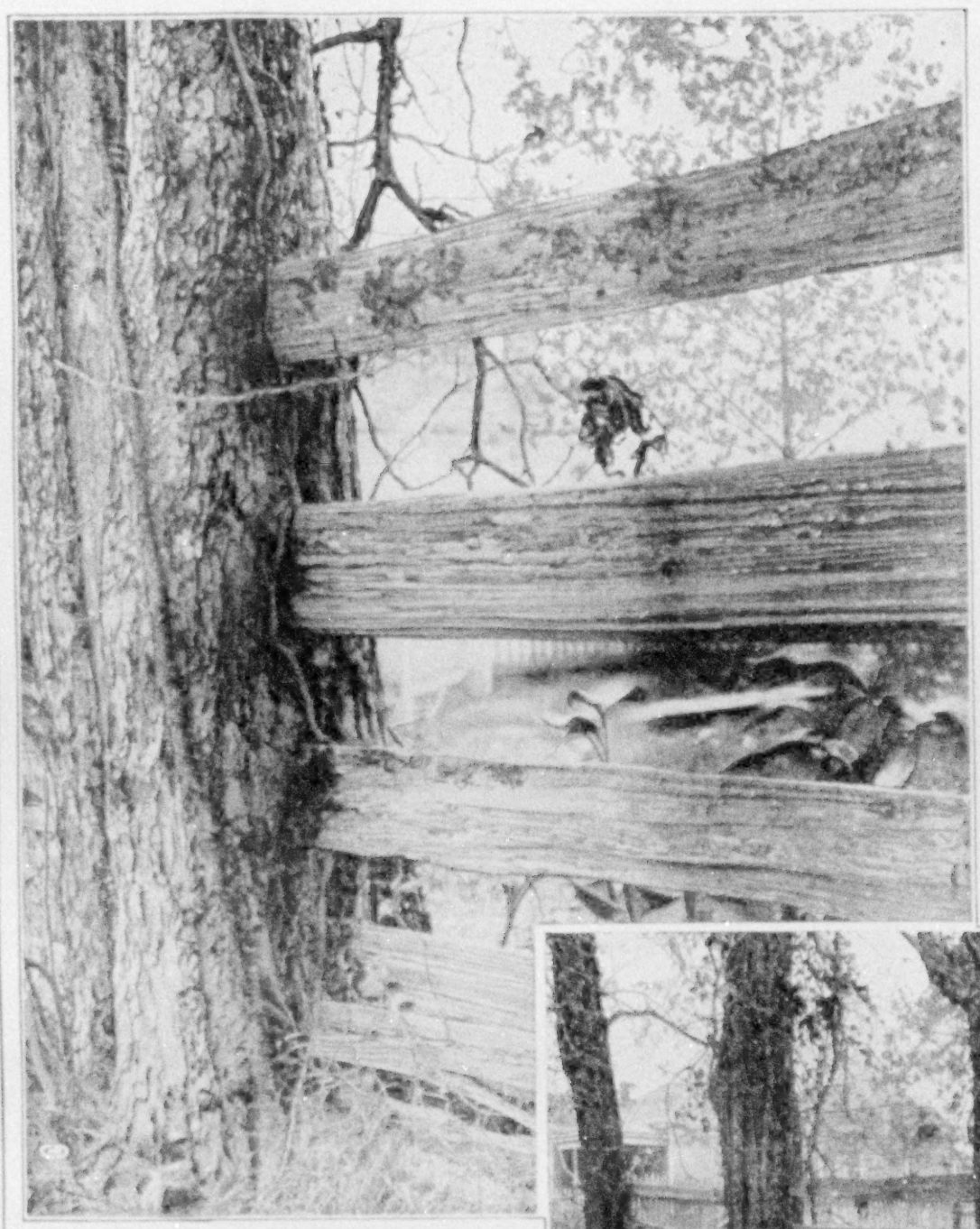
The Goodyear Tire & Rubber Co., Akron, Ohio

GOODYEAR
AKRON
CORD TIRES

"Mention the Geographic—It identifies you."

Does Cypress "The Wood Eternal" Last?!

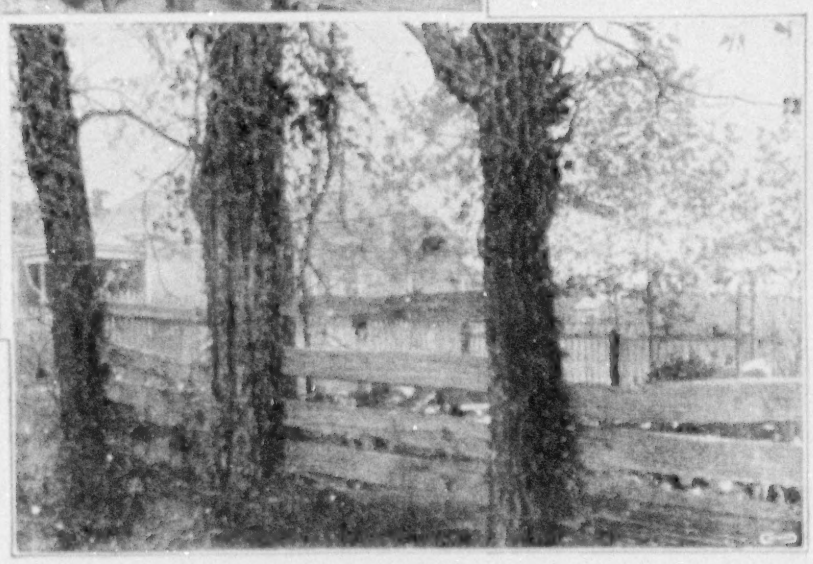
Study These Photographs of an "Ingrowing Fence"



WITHOUT A NAIL OR A PEG IN IT.

Below is a glimpse down a country highway ("de big road," as Uncle Remus called it) near Monroe, Louisiana. That fence has no posts. It was built by forcing split Cypress boards between saplings. This occurred so many years ago that nobody knows when it was, nor who was the labor-saving genius who did it. Then the trees grew, and grew, and grew.

NOW, PLEASE study the larger photograph and see in detail how the fence looks today. Note the size of the tree, and how deeply are embedded the ends of those old Cypress rails—no one can tell how deep they extend in. Note, also, how weathered they are; yet they ring as true and sound under a hammer as though just hewn. Were those old Cypress boards somebody's money's worth? Why should not YOU do as well with *your* lumber money—whether you are building a beautiful home or just patching up the old place? (USE CYPRESS.)



"THE PROOF OF THE FENCING IS IN THE LASTING."

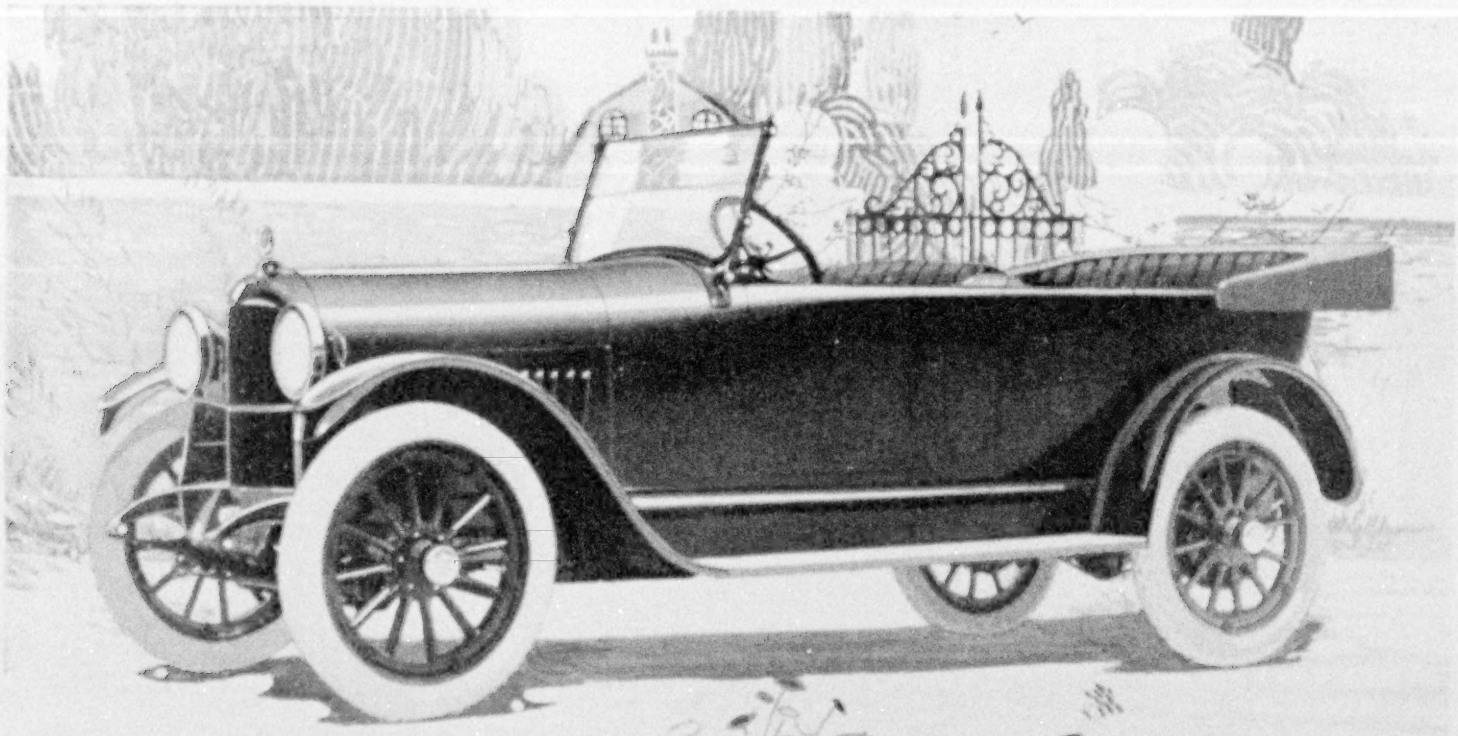
"Build of Cypress Lumber and You Build but Once."

Let our "ALL-ROUND HELPS DEPARTMENT" help YOU. Our entire resources are at your service with Reliable Counsel.

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

1224 Hibernia Bank Bldg., NEW ORLEANS, LA., or 1224 Heard National Bank Bldg., JACKSONVILLE, FLA.

INSIST ON CYPRESS AT YOUR LOCAL LUMBER DEALER'S. IF HE HASN'T IT, *LET US KNOW IMMEDIATELY.*



PAIGE

The Most Beautiful Car in America

AT THE earlier automobile shows, the reception accorded the New Paige Models has amounted to a genuine ovation.

The Paige booths have been thronged with visitors from morning until night. Hundreds of disinterested men and women have personally sought out the officials of our company and congratulated them in the most glowing terms.

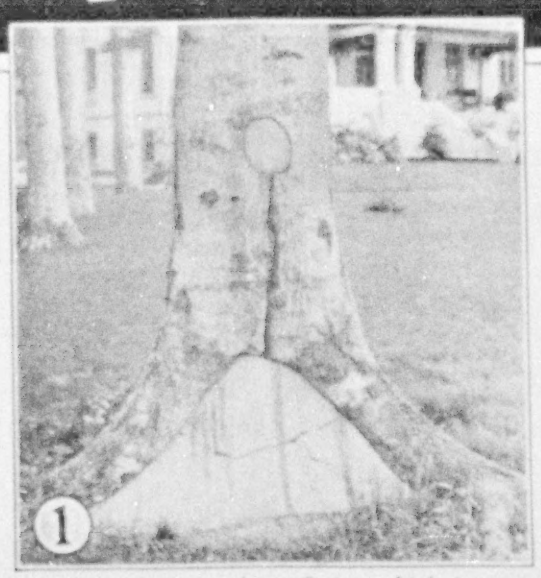
Seasoned motor car distributors from all sections of the nation have been equally lavish in their praise, and each day our mails are filled with communications expressing the same enthusiastic approval.

So you can see we have reason to feel proud—and *do* feel proud. We know, too, that every Paige owner will share this feeling with us when he first sees and rides in "The Most Beautiful Car in America."

Stratford "Six-51" 7-passenger $1495 f. o. b. Detroit
Linwood "Six-39" 5-passenger $1175 f. o. b. Detroit

Paige-Detroit Motor Car Company, Detroit, Mich.

Tree "patching" cannot



A crude cement patch—ineffective and injurious.

Cement patch removed—showing extensive and neglected decay.

Five typical letters from hundreds by satisfied Davey Clients.

Mr. Geo. M. Verity, Pres. The American Rolling Mill Co., Middletown, Ohio.

"The work which your men did on my premises has every evidence of being first class in every respect."

Mr. T. W. Snow, Pres. T. W. Snow Construction Co., Chicago, Ill.

"The work which you did at my place six or seven years ago is so satisfactory that I have not found it necessary to do anything more. Every tree you treated, including the worst ones, have since that time made new and beautiful trees."

Mr. Edward Holbrook, Pres. The Gorham Co., New York City.

"I wish to express the satisfaction we have had in your work. The work has been done in a thorough manner and your foreman and his assistants are entitled to great credit."

Mr. William H. Graffin, Falston Manor, Glencoe, Baltimore Co., Md.

"The work done at my place has been done in a very satisfactory way and you are fortunate in having such efficient and industrious employees, a refreshing experience in these days of carelessness and shirking."

Mrs. Charles G. Weld, Brookline, Mass.

"I am very much pleased with the result of your work on my trees. . . . From their present appearance I do not see why they should not last many years longer, whereas last year we had grave doubts as to their living."

THE *tree is a living organism;* it breathes, assimilates food, has a real circulation. Its normal condition *is health*, but it is subject to disease and decay, just as any other living thing.

As with one's body or one's teeth, the tree responds only to that treatment which is in scientific accordance with Nature's laws.

The physician, the surgeon, or the dentist requires years of patient study, plus the intuitive skill born of ripe experience, before he is equipped to obtain successful results.

This is also exactly true in Tree Surgery. However, in Tree Surgery, scientific accuracy is not enough. Think of the terrific windstorm, with its bending and twisting! You will then realize that Tree Surgery must be mechanically perfect to withstand it. The mechanical principles and methods of bracing employed by a real Tree Surgeon would amaze you.

Facts little understood

Because the facts set forth above have not been understood, great injury has been done to thousands of trees everywhere and a vast amount of money has been wasted in disastrous tree "patching."

Photograph No. 1 illustrates a typical case of tree "patching." To the untrained eye this work probably looks good, but a Davey Tree Surgeon saw at a glance that the conditions were bad. Growths of fungus disease appeared along the edges of the filling and on the bark between the large and small fillings.

Photograph No. 2 shows the filling taken out. Nearly every principle of the science of Tree Surgery had been violated—the rough decay *only* had been removed; the cavity had not been disinfected; the condition of decay behind this crude cement patch was actually appalling, and the filling had only been in two or three months; no bracing of any kind had been used; no means had been provided to exclude moisture; the large filling had been put in as a solid mass, making no allowance for the sway of the tree.

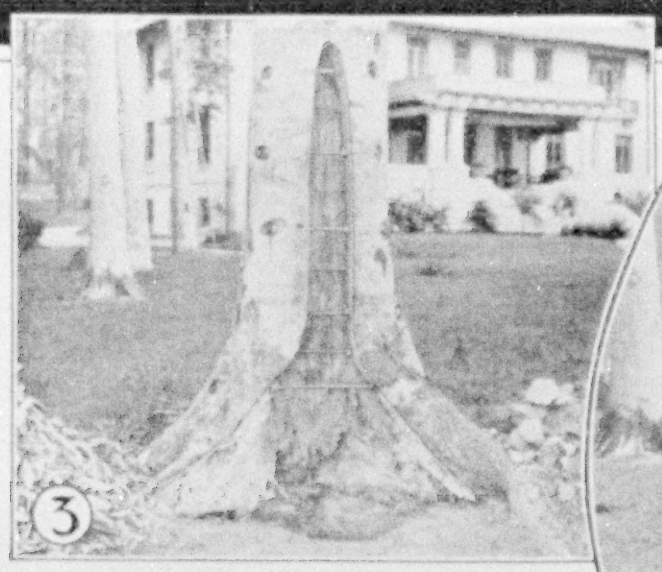
Photograph No. 3 shows all decay removed by a Davey Tree Surgeon; the cavity thoroughly disinfected and waterproofed; the mechanical bracing partly in place; the watersheds cut to exclude moisture.

Photograph No. 4 shows the Davey filling completed, put in sectionally to permit swaying without breaking the filling. This tree has since stood through many severe storms in perfect condition. New bark is now growing over the filling along the edges. The tree has been saved permanently!

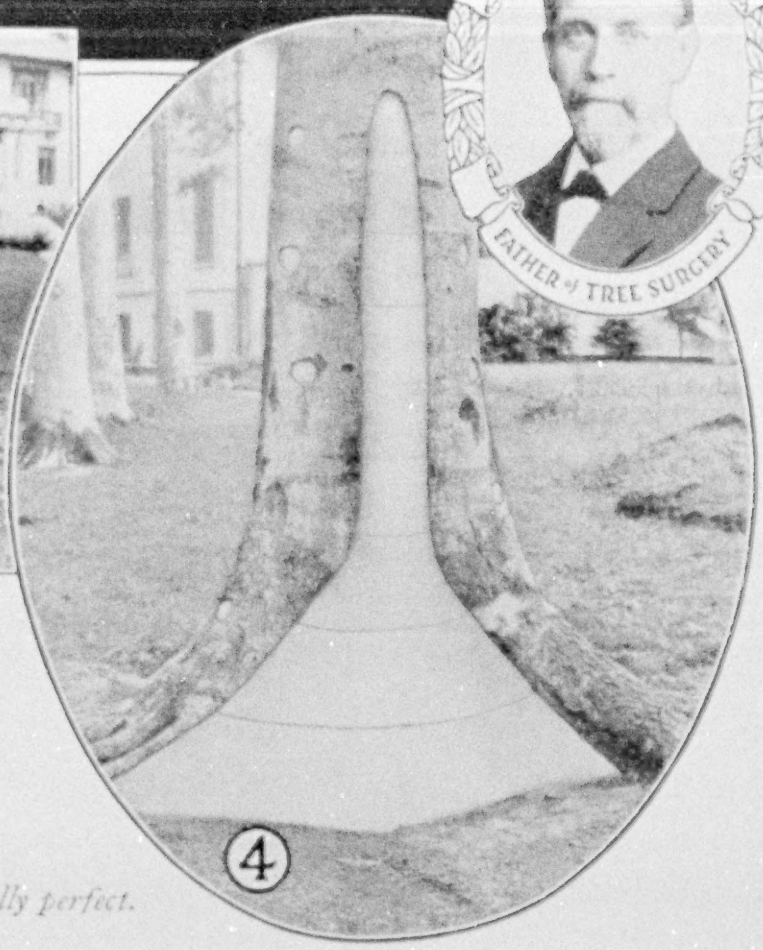
Davey Tree

Every real Davey Tree Surgeon is in the employ of the Davey Tree Expert Company and the public is cautioned against those falsely representing themselves.

save your trees!



All decay removed, cavity disinfected and waterproofed, mechanical bracing installed.



This is Davey Tree Surgery. It is scientifically accurate and mechanically perfect. The sectional filling permits swaying without cracking.

Davey Tree Surgery is *safe*

It is scientifically accurate and mechanically perfect.

Safe—because Davey Tree Surgery is time-proved; its record of successful performance for thousands of estate owners spans a generation.

Safe—because no Davey Tree Surgeon is allowed any responsibility until he has conclusively demonstrated his fitness. He must have served his full course of thorough practical training and scientific study in the Davey Institute of Tree Surgery—a school, the only one of its kind in the world, which we conduct for the specific purpose of drilling our men according to Davey methods and Davey ideals.

Safe—because we, who know values in Tree Surgery and who demand and deliver the best, select the man to whom the treatment of your priceless trees is to be entrusted.

Safe—because Davey Tree Surgery has been endorsed as *best* by the United States Government after an exhaustive official investigation.

Safe—because Davey Tree Surgery is recommended by thousands of prominent men and women, whose endorsement you can accept with complete confidence. (Several such endorsements appear on the left.)

Safe—because Davey Tree Surgeons are *picked* men, thoroughly trained, conscientious, intelligent, courteous, in love with their work—"Men," writes Dr. H. D. House, New York State Botanist and formerly professor in Biltmore Forestry School, "who would do honor to any institution of learning in America."

Safe—because the Davey Company is a successful and responsible house, amply able to make good in every instance, and not needing, for the sake of temporary existence, to sacrifice in the slightest degree its high standards.

The Davey Tree Expert Co., *Inc.*

1502 Elm Street, Kent, Ohio

Operating the Davey Institute of Tree Surgery, Kent, Ohio

Branch Offices with telephone connections: New York, Philadephia and Chicago

Permanent representatives located at Boston, Newport, Lenox, Hartford, Albany, Poughkeepsie, White Plains, Stamford, Jamaica, L. I., Morristown, N. J., Philadelphia, Harrisburg, Baltimore, Washington, Buffalo, Pittsburgh, Cleveland, Detroit, Cincinnati, Louisville, Chicago, Milwaukee, Minneapolis, St. Louis, Kansas City. Canadian address: 81 St. Peter Street, Quebec.

Surgeons

FOR *SAFE* TREE SURGERY

Write today for FREE
Examination of your Trees

—and booklet, "When Your Trees Need the Tree Surgeon."

What is the real condition of your trees? Are insidious diseases and hidden decay slowly undermining their strength? Will the next severe storm claim one or more as its victims? Only the experienced Tree Surgeon can tell you fully and definitely. Without cost or obligation to you, a Davey Tree Surgeon will visit your place and render an honest verdict regarding their condition and needs. Write today.

XUM

Write Today For FREE Book on Home Refrigeration

Right now's the time to plan for next summer's hot weather! Protect yourself against exorbitant ice bills—against the possibility of having half-spoilt, germ-infected food—against offensive odors and unappetizing conditions.

This handsomely illustrated 36-page book is crammed full of interesting facts about Home Refrigeration. It tells you how to cut down your ice bills—how to keep your food fresh and wholesome—what to seek and what to avoid in selecting a Refrigerator; tells all about the famous, ice-saving

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SOLID PORCELAIN REFRIGERATOR

Endorsed by Good Housekeeping Institute

With beautiful, snow-white food compartments molded in one piece of *genuine inch-thick solid porcelain ware*, with every corner rounded, assuring absolute cleanliness. Not a single crack, crevice or corner to harbor dirt, germs, moisture and odors. A handsome, expertly-built, lifetime Refrigerator that *locks out the heat* and assures maximum coldness and dryness and *minimum ice consumption*. Used in the best homes and leading hospitals throughout the country.

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and will respond immediately to Takoma Lawn Plant Food.

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Concentrated—Scientifically Correct—Efficient—Economical—Odorless.

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100- 200 lbs. at 4½ cents per lb.	100- 200 lbs. at 5½ cents per lb.
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Orders shipped same day they are received.

ODORLESS PLANT FOOD COMPANY
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It is not sufficient to merely plant the seed and then expect to obtain perfect specimens like those illustrated in the seed catalogs.

Send for Instructive Book:
"The Maintenance of Lawns and Golf Courses."

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Find out about this ideal Northern trip before deciding on any trip for next summer! "Opinions," our 36-page booklet, gives you a wonderful insight into this great Wonderland—the unusual trip, whose grandeur will fill you with awe and whose beauty will delight you!

See the Inland, too

Sail down the famous Yukon through the Five Fingers Rapid to Dawson in the Marvelous Klondike; or on down, crossing and recrossing the Arctic Circle, where you will see that never-to-be-equaled wonder, The Midnight Sun; to Fairbanks and Nome, and return via Seward, Valdez, and Cordova. No continent can offer you more glorious beauty than our own Alaska. See America *First!*

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White Pass & Yukon Route

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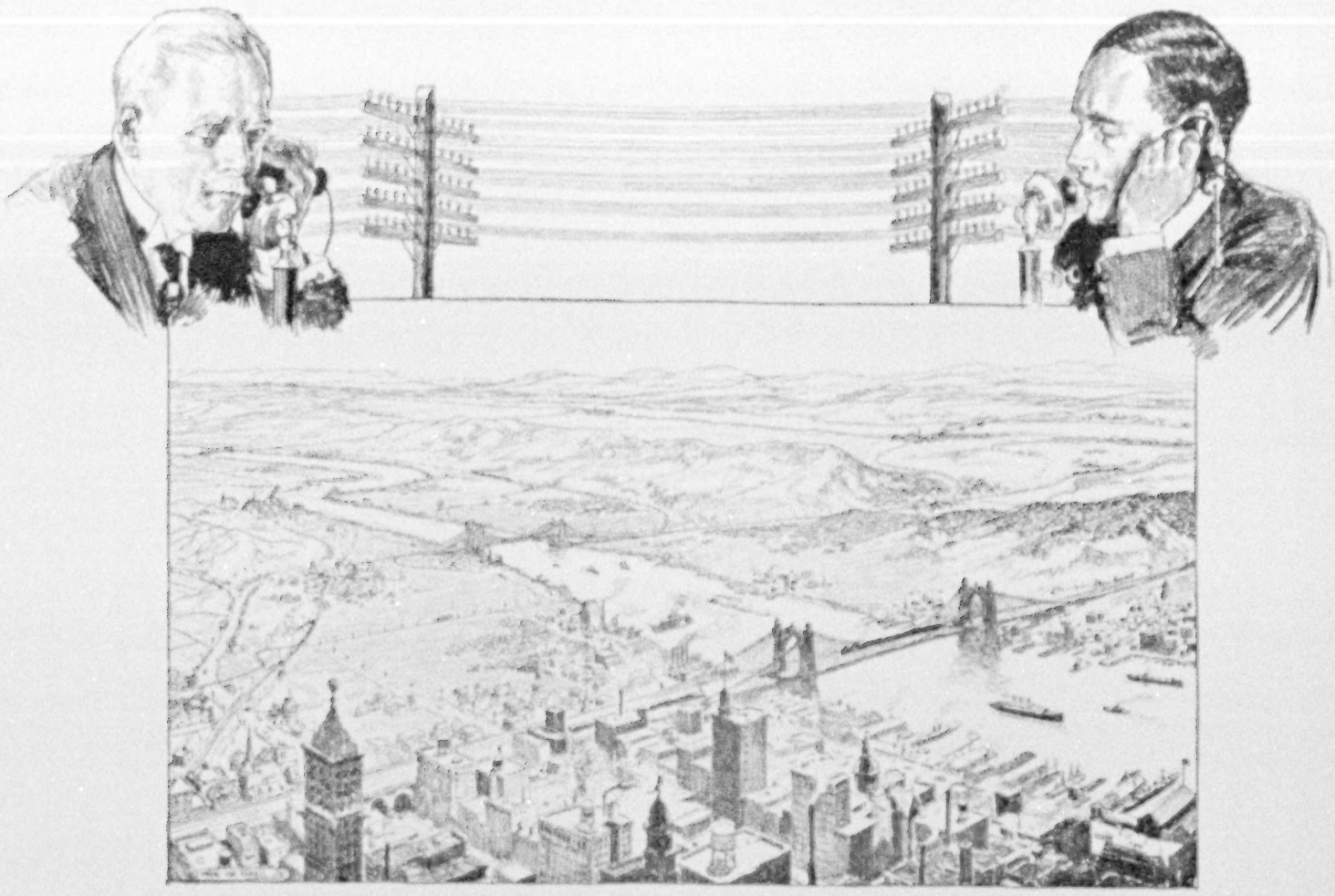

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Straight as the bee flies and quick as though caught by lightning the voice in the telephone carries near and far over this Nation.

This marvelous instrument is the pre-eminent vehicle of speed and speech. Railroads cover the country, but your traveler often must alight with bag and baggage and change trains to get to a given point. Railroads reach cities, towns and villages. The telephone reaches the individual.

The telephone offers continuous passage for the voice and unbroken connections to the uttermost places because it is a united System co-ordinated to the single idea of serving the entire people of this country.

It has been a powerful factor, along with the transportation systems, in the magnificent achievements of the United States—helping to prepare the way where latent possibilities of mines, forests and farms were to be developed.

The continued growth of our national prosperity depends in a great measure upon the maintenance and continued growth of the utilities which furnish the means of intercourse and interchange. They are the indispensable servants of the individual, the community and the entire nation.

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These friendly little brown birds will soon be here looking for a home. Hang up my 4-room Wren Bungalow and a family will move right in and raise 2 or 3 broods.

I have studied bird habits and worked for bird protection for 22 years. My houses *bring the birds* because the *birds like them.* Entire collection described in catalog, with prices. Includes bird baths, feeding devices, etc. All are patented.

Bird Book Free. My illustrated book tells how to attract birds to your garden. With it I send free my beautiful "Nature Neighbors" folder, together with a colored bird picture worthy of framing. Write to (11)

$5.00 for this 4-room Dodson Wren House; built of oak; roof of cypress, with copper coping. Wrens won't live in a one-room house; they want a fresh room for each brood.

JOSEPH H. DODSON

Director of the National Audubon Ass'n

702 Harrison Ave., Kankakee, Ill.

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HARRISON MEMORIALS of CHARACTER

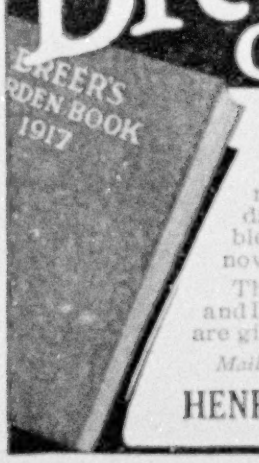
Representatives in principal cities. Write for Booklet 3.

HARRISON GRANITE COMPANY

200 Fifth Avenue, New York City Works: Barre, Vt.

PERSONAL SERVICE

Dreer's 1917 Garden Book



contains 288 pages, four color and four duotone plates, besides numberless photographic true-to-life reproductions. It lists all the standard varieties of flowers and vegetables, as well as the best of the season's novelties.

The newest Roses, the best Dahlias, and Dreer's Improved Hardy Perennials are given special prominence.

Mailed free to any one mentioning this Magazine.

HENRY A. DREER 714-16 Chestnut St. Philadelphia, Pa.

No. 60, Robin No. 61, Wren No. 62, Bluebird

Back-to-Nature movement among the Birds

—Birds, as well as persons of good taste, like these garden fixings to be Rustic.

$1.25 each, 3 for $3.50. Booklet, "Bird Architecture," free with every order.

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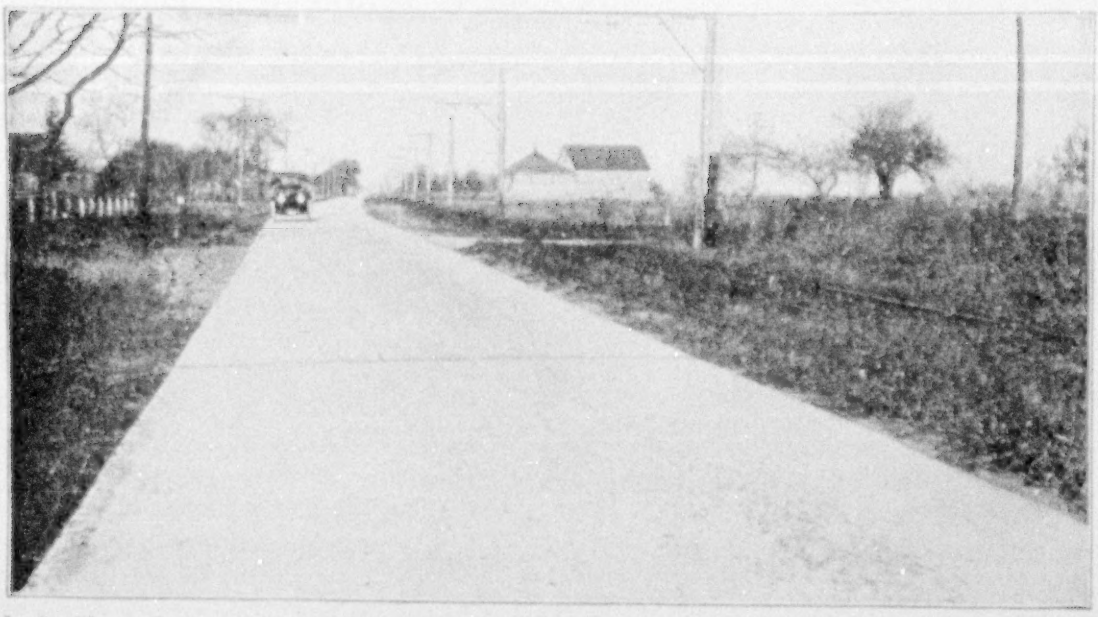

Lake Shore Concrete Road Near Kenosha, Wis., Built for the State Highway Department by G. R. Wade, of Kenosha, in 1915

Good Roads Saved Paris

An English general, when asked what he thought was the greatest feat in the present war, replied: "The way General Joffre saved Paris by commandeering 20,000 autos and motor busses and moving an army overnight against Von Kluck's flank." Without a great number of automobiles and *every* road good, this couldn't have been done.

In 1915 there were 122,000 automobiles in France. There are now three million in the United States. We have the automobiles, but mighty few good roads for them to run on.

Concrete has been in satisfactory use for many years and the mileage is increasing by leaps and bounds—17,000,000 square yards in 1915 and 25,000,000 in 1916. Clean—even—gritty—it is comfortable and safe every day in the year.

The materials are the same as those used in such important structures as the Panama Canal and big railroad bridges. Portland cement is a staple product, on sale everywhere. Sand and broken stone, or pebbles, are equally available. Common labor under skilled supervision can do the work.

It is easy for you to find out about this important subject. A free copy of "Concrete Facts About Concrete Roads" will be sent on request. Ask for Bulletin No. 136. One of our Road Engineers will gladly call on you and discuss means of financing and building a system of concrete roads in your community. He will also help you to get your neighbors and road officials interested.

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"That lawn, so beautiful today, would look as barren and forlorn as when the house was built were it not for MOON. They told me what was needed—all by correspondence, too, I only sent them a rough sketch of the grounds."

Unquestionably there is a decided advantage in dealing with a Nursery that have hardy Trees and Plants for Every Place and Purpose. Each order is filled with freshly dug stock, never more sturdy, and most carefully packed for shipment to any distance.

Write us for Catalogue A-5, over 2200 varieties shown and listed. Our Letter-Aid will advise you what will best suit your climate and soil.

THE WM. H. MOON COMPANY

Nurserymen

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PHILADELPHIA OFFICE
21 South Twelfth Street

THE MOON NURSERY CORP.
White Plains, N. Y.

Meehan's Mallow Marvels

These absolutely hardy perennials, originated by us, are of such surpassing beauty that they are considered the sensation of the plant world today.

From mid-summer until frost, when the sturdy bushes are covered with their gorgeous blossoms, the effect is really dazzling.

Even a single specimen, while in bloom, is the most conspicuously beautiful feature of the lawn or yard, and, used in masses, they dominate the entire grounds. No flower-lover can afford to be without them.

Our 1917 Hand Book

gives details and prices of Meehan's Mallow Marvels and hundreds of other specially choice, well-grown trees, shrubs, and hardy flowering plants. Write for it today. Mailed Free.

THOMAS MEEHAN & SONS

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FIVE CHANGES OF LIGHT

The DIM-A-LITE turns on just the amount of light you want. A soft glow for the nursery; a little brighter for the hall; more or less as needed for bed room, sick room or bath.

DIM-A-LITE Attachment — Fits any Socket and Lamp — $1.10

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Ask your dealer, or by mail, postpaid. Write for "Facts on Saving of Current."

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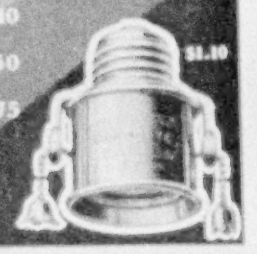
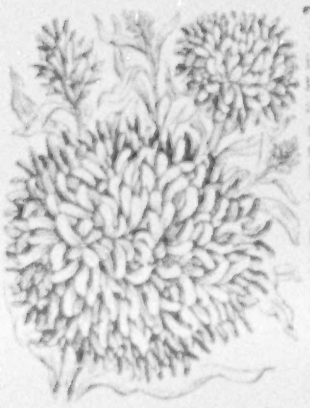




The Chinese Woolflower

introduced by us three years ago is now acknowledged to be the greatest new garden annual. It is a success everywhere, plants growing 2 to 3 feet, a pyramid of color, its many branches bearing great balls of wool-like substance and most intense crimson scarlet.

Flowers develop in June and none fade before frost; ever brilliant and showy beyond belief. **Seed per pkt. 10c., 3 for 25c.**

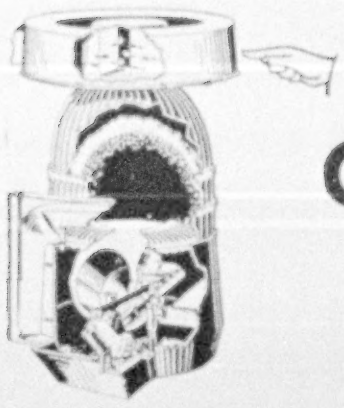
New Mastodon Pansies. For immense size, wonderful colors and vigor they are marvels. **Seed per pkt. 10c., 3 for 25c.**

Ever-blooming Sweet William, a startling novelty, blooming in 60 days from seed, continuing all the season, and every season being hardy. Flowers large, colors exquisite—**pkt. 10c.**

These 3 great Novelties, with two more (5), for only 20 cts. See Catalog for colored plates, culture, etc.

Our Big Catalog of Flower and Vegetable Seeds, Bulbs, Plants and rare new fruits free. We are the largest growers in the world of Gladiolus, Cannas, Dahlias, Lilies, Iris, etc.

JOHN LEWIS CHILDS, Inc., Floral Park, N. Y.



THIS Cut Coal Cost $50.00 HERE

With a great deal more Comfort into the Bargain!

Open space all around this big 10-room house. And in a part of the country where the mercury tries to drop clear through the glass in winter. Makes no difference to the Williamson UNDERFEED, though. A fifty dollar coal-saving and more comfort in spite of it all. Read the letter:

"Mine is a ten-room house, and always cost me over $100 to heat with the old boiler. This winter cost $50 with the UNDERFEED, and we had a great deal more comfort—72 or over in the coldest weather. A fuel-saver, time-saver, and dirt-saver.

(Signed) DR. W. J. MORGAN, Mineral Point, Wis.

WILLIAMSON UNDERFEED Furnaces Boilers

Cut Coal Bills ½ to ⅔ Guaranteed

Please let this fact sink in: A ½ to ⅔ saving in coal cost is actually guaranteed with the Williamson UNDERFEED, whether you heat with warm air, hot water, steam, or vapor.

That is partly because the UNDERFEED burns the cheaper grades of coal as effectively as others burn the costlier grades. That's a big saving at the very outset—money you save by keeping it in your pocket. Another reason is the scientific principle of combustion. In the UNDERFEED coal is fed from below. The hot, clean fire is always on top—never smothered or chilled by fresh coal being dumped on. All smoke, soot, and gas must pass up through the fire and so be transformed into clean, usable, effective heat.

No waste whatever. No clinkers. No partly burned coal. No soot-encrusted pipes.

Money-Saving Book Free

And a boy of twelve can operate the UNDERFEED successfully. No stooping. All done from a standing position.

There's an interesting book, "From Overfed to UNDERFEED," which pictures and describes it all. Free for the asking. Simply send coupon. It will save you many a dollar when you come to install that new heating system. Remember, ½ to ⅔ coal cost actually guaranteed with a Williamson Underfeed. Send the coupon now.

THE WILLIAMSON HEATER CO.
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THE WILLIAMSON HEATER CO.
28 Fifth Avenue, Cincinnati, O.

Tell me how to cut my coal bills from ½ to ⅔ with a Williamson UNDERFEED.

Warm Air---------- Steam or Hot Water----------
(Mark X after System interested in)

Name----------

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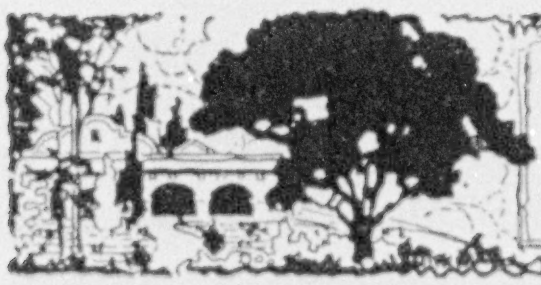
My Heating Contractor's Name is----------

Heating Contractors: Let us tell you about the Williamson UNDERFEED and our new proposition. Both are winners.



The 1917 Woodlawn Catalogue is filled with beautiful garden scenes and handsome illustrations of the flowers themselves. It lists a large variety of plants, shrubs, roses, fruit and ornamental trees. You will appreciate a free copy. Send for it today.

Woodlawn Nurseries Allen L. Wood, Prop.
919 Garson Avenue, Rochester, N. Y.

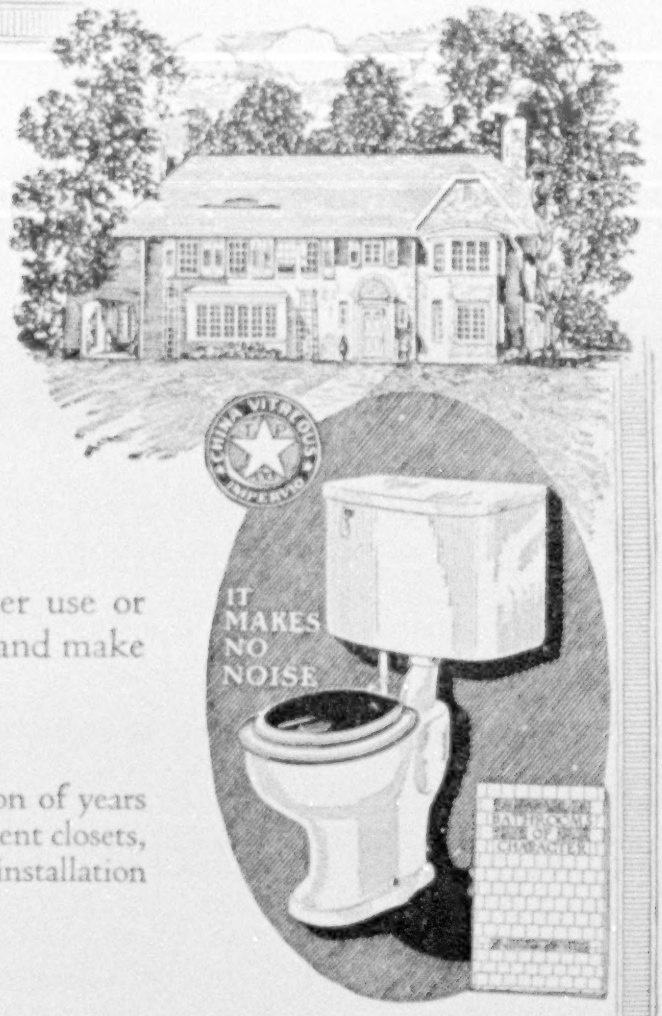
The Proph-lac-tic Tooth Brush

Used every day—note how your smile improves

"Mention the Geographic—It identifies you."

In Your Home

The Silent Si-wel-clo



Place the Silent Si-wel-clo and any other closet side by side—the difference in appearance does not disclose to you the mechanical superiority or silence of operation of one over the other.

You cannot tell which will clog and foul under use or which set of fittings will get out of order first and make an expensive plumbing job.

You will have to take *somebody's* word for it.

The manufacturers of the Silent Si-wel-clo, by reason of years of experience and investigation of the merits of different closets, are in a position to offer you expert advice in closet installation that cannot be disputed.

Write for "Bathrooms of Character." You will find it instructive in planning your bathrooms. Ask for Booklet P-27

THE TRENTON POTTERIES CO.

SILENT SI-WEL-CLO CLOSET

incorporates the good, mechanical features a water closet should have and adds that of extraordinary quiet operation. One is just as important to the home owner as the other. Why disturb the feeling of security from embarrassing noises by maintaining or installing an old-time, noisy closet?

The Silent Si-wel-clo is your protection against dissatisfaction. The name is stamped upon it so you cannot be deceived. In fact, it will pay you to see that the "Star Within the Circle" trade-mark appears on all your plumbing fixtures.

THE TRENTON POTTERIES COMPANY

TRENTON, NEW JERSEY, U. S. A.

WORLD'S LARGEST MAKERS OF ALL-CLAY PLUMBING FIXTURES

This is the Mathews Hallmark, a guarantee of quality and authenticity of design.

Mathews GARDEN-CRAFT

Have you a nook in your garden that invites a cozy bench? Or a vista that deserves a trellised arch or pergola?

Gardencraft Furniture and landscape ornaments reproduce selected designs garnered from old prints, Old World vistas, and the best of modern schools. 72-page catalog sent on receipt of 18 cents in stamps.

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1916—BOUND VOLUMES—1916

OF THE

National Geographic Magazine

Nowhere else can be found such a wealth of photographic reproduction, not only in black and white, but scores of pages of four- and eight-color work, photogravures, panoramas, and maps which vitalize the authoritative articles specially prepared by the foremost scientists, explorers, and travelers in the world.

A limited number of volumes for 1916, with index, have been beautifully bound in half morocco, containing 1,400 pages of text, with 1,200 pages of illustrations, including color work, photogravure, maps, etc. Bound in two volumes (6 months each). Price for both, $6.00 Sent prepaid in the United States. Address, Dept. B.

You and a Thousand Times You

SUPPOSE a day had thirty-six hours instead of twenty-four—and you had four hands instead of two—and you could be two places at the same time instead of one—

You'd be a superman, wouldn't you?

But it hasn't, and you haven't, and you can't!

There is only one *You*. If you could give a thousand men *your* knowledge of the business—*your* ambition—*your* personality—then

It would, and you would, and you could!

The thing that makes you *you* isn't the way you comb your hair or wear your clothes. It isn't your person—but your personality.

Put that personality into a thousand Multigraphed letters and you can accomplish thirty-six hour results in twenty-four hour time—do the work of four hands (or more) instead of two—be two places (or more) at the same time instead of one.

That's one Multigraph accomplishment—to carry your message—your personality—you—into all parts of your business world.

Think of the possibilities when you, plus a thousand times you, work together in carrying out your plans.

Or, make it ten thousand or a hundred thousand times you—for it's all one and the same to the Multigraph.

Are you confined, restricted, tied down to you, twenty-four hours, two hands and one place? Expand, man, expand, and take your business along with you!

The Multigraph is the easiest way—the coupon the quickest route.

The Multigraph Senior

ELECTRICALLY driven and completely equipped for high-grade printing—with printers' ink, type, or electrotypes; or for producing typewritten letters in quantities.

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Produces real printing and form-typewriting, rapidly, economically, privately, in your own establishment

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Show me how I can expand my personality and my business.

Name
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Purity Cross Creamed Chicken a la King

The Choice Delicacy of the "Four Hundred"

The proudest dish of the finest hotels and clubs, now prepared by a Master Chef from the Ritz of Paris, ready to serve at home. Only 25c and 50c at all Fine Grocers. Sent direct at $1.45 or $2.85 half dozen respective sizes, express prepaid if you mention your best grocer's name. Write, mentioning his name, for booklet, "How and When." Canadian Prices, 35c, 65c, $2.00 and $3.75 half dozen respective sizes. PURITY CROSS, Inc., Model Kitchens, Route 2 G. M., Orange, N. J.

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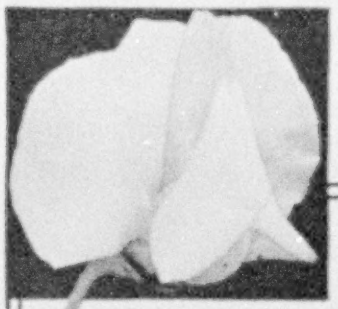
ASHEVILLE, N. C.
"In The Land of the Sky"

PERFECT GOLF IN A PERFECT CLIMATE
18 holes—Turf greens

Famous the year round for its Southern hospitality. Most delightful in late Winter and early Spring. Write for Booklet. Make reservations.

IN AMERICA - AN ENGLISH INN



King White Sweet Pea

This new, wonderfully beautiful white Sweet Pea is superior to any other variety; petals frilled; four flowers to a stem. A full-size packet will be sent for *15 cents*, and with it we will send

Our 1917 Catalogue of Flower and Vegetable Seeds, Plants, Roses, Shrubs, which is free to you and to every reader of this magazine. We sell direct to you and guarantee delivery. Write today for the catalogue.

The Storrs & Harrison Co.
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ARKANSAS

Greatest Health and Pleasure Resort in the World
Owned by the

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The curative properties of the waters of Arkansas Hot Springs are known the world over. Their use is endorsed and regulated by the Government. The climate is bracing, scenery beautiful; social life and sport in abundance.

For information, illustrated booklet, etc., write
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This advertisement inserted by the Arlington-Eastman Hotels.

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The Membership Fee Includes Subscription to the National Geographic Magazine

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Please detach and fill in blank below and send to the Secretary

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To the Secretary, National Geographic Society,
Sixteenth and M Streets Northwest,
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I nominate _____

Address _____

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for membership in the Society.

_____

2-17 (Write your address)

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HESS-IVES COLOR PHOTOGRAPH

MAKE your spring campaign with the camera a color campaign. With your own camera you can now take photographs in color by using

The Hiblock

This is a pack of two sensitized blue and red plates with a green film interposed, bound together as one. It fits into *your own* camera, whether a film Kodak with a combination plate back, or any other that will take a plateholder, so that you may take color photographs when you like—as many reproductions as you like—or use your camera for black and white work as heretofore. Let us tell you about this most notable development in color photography. *Send for booklet.*

HESS-IVES CORPORATION
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DENBY
TRUCKS
FOR TRAIL OR PAVEMENT

MUCH of the rapidly-growing preference for internal-gear driven trucks is due to the performance of the Denby, a pioneer in this field.

Denby Motor Truck Company
Dept. M Detroit, Mich.

A Garden Full of Gladioli
for $1.00

The Gladiolus is one of the most satisfactory flowers grown, because it blooms continuously when it is cut and put in water, just as well as when in the ground.

There is no reason why every family cannot enjoy this grand flower, for the simple reason that it is as easy to grow as the potato.

You can have them in bloom from July to frost if you plant a few bulbs each month from April to July.

For only ONE DOLLAR we will send 75 Bulbs of our Grand Prize Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Last year we sold thousands of these bulbs and have received numerous testimonials as to their merits.

ORDER YOUR BULBS NOW, so as to have them to plant when you begin making your garden.

Simple cultural directions with every package.

Write today, mention "National Geographic Magazine," and secure this splendid collection of Gladiolus bulbs for only $1.00, prepaid to your home anywhere in the United States, with our 1917 Spring Catalogue.

Stumpp & Walter Co
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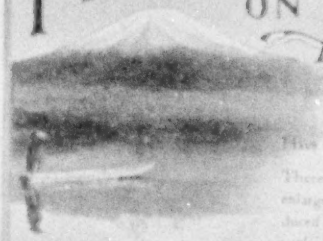

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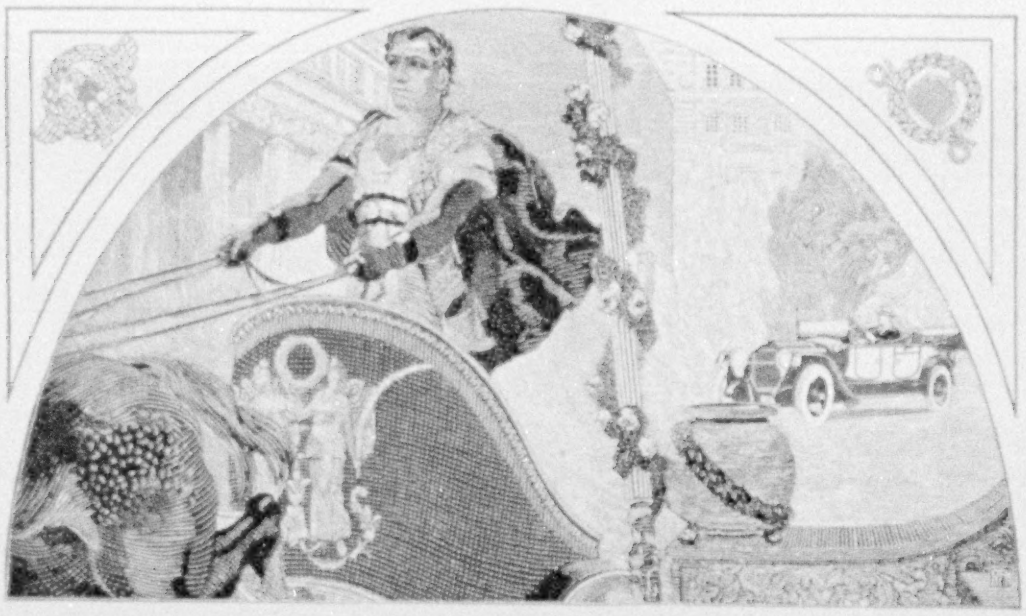
HEATHERHOME SEED AND PLANT BOOK
A MASTERPIECE OF GARDEN CATALOGUES

Tells just the things you want to know. 336 pages, antique paper, bound in Heatherhome blue, in a box, FREE. A beautiful, fascinating book. We *guarantee* your pleasure in it just as we *guarantee* to grow, and to be as described, every seed and plant that comes from the "Home of Heather." Write for it *now*.

KNIGHT & STRUCK CO.
PLANTSMEN-SEEDSMEN
260 FIFTH AVENUE, NEW YORK

"Mention the Geographic—It identifies you."

XUM



Dominant! The car of *the master*—from Roman to Packard days—has mirrored and proclaimed the character of the man

Strong men express themselves in their personal equipment.

And the stronger the personality the more dominant that expression is apt to be.

Patrician!

Utility, fashioned in refinement's mould—and *fitness*, down to the smallest detail—have always been demands of those who lead in the world's modes.

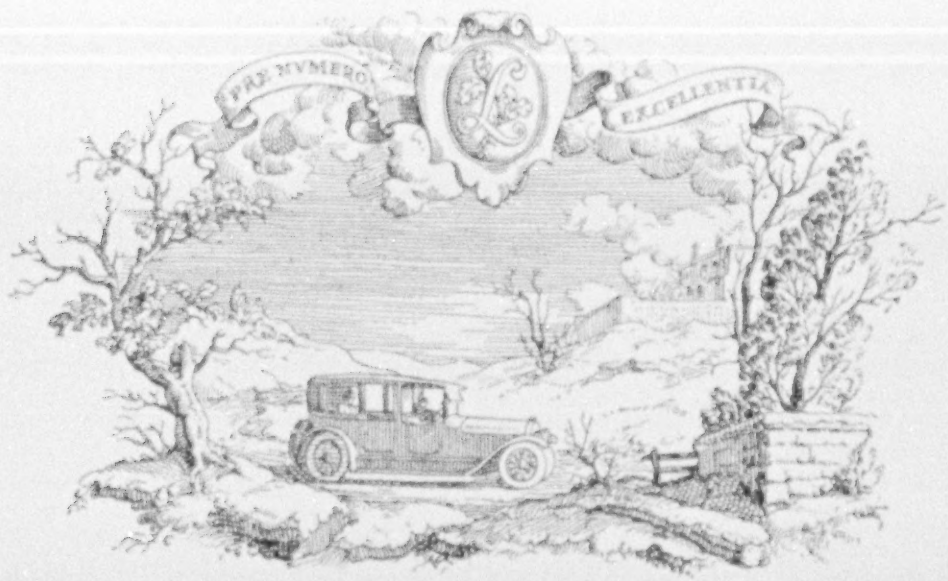
The unstinted power of the Twin-six motor makes the most luxurious Packard boss of the highway. And this disciplined, economical, unlabored *mightiness* allows the widest margin of safety, beauty and comfort.

That fine standard of fitness—the demand of the patrician—more than ever before is now satisfied by the masterful Twin-six.

Ask the man who owns one

Twenty distinctive styles of Twin-sixes. Prices, open cars $3050 and $3500, at Detroit. Packard branches in all important cities

Packard TWIN-6



LOCOMOBILE

For every one that is built, thousands of other Cars are manufactured.

The energy and skill expended on a single Locomobile would make twenty Cars of the usual sort.

The Chassis with Locomobile Coach Work $4700. to $7100. With Coach Work designed and built to order, from about $5700. to $9700.

THE LOCOMOBILE COMPANY OF AMERICA

Makers of Fine Motor Cars

PRESS OF JUDD & DETWEILER, INC

M. V. WATSON, VICE PRESIDENT

PIONEER LIFE INSURANCE CO.

OF AMERICA

Kansas City, Mo.

Refer to Mr Colgate

Sept 11th 1916

Colgates
New York

Gentlemen = Increase the enjoyment of shaving? It can't be done when one uses Colgates Shaving Cream, you are attempting the impossible when you advocate it.

You are attempting to build up the sale of your Talc Powder, Lilac Imperial Water and Charmis Cold Cream on a false foundation.

Take your Shaving Cream, a good razor and use plenty of water and you have the acme of shaving enjoyment.

Back up!

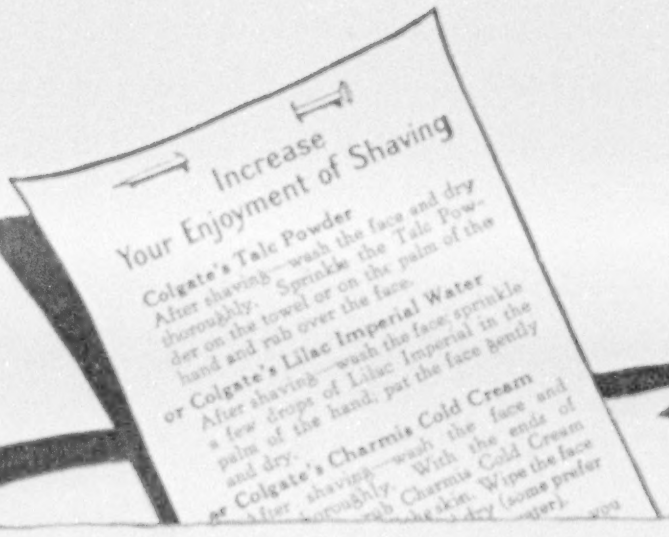
Very Truly Yours
M. V. Watson

It might have been more nearly correct if we had said "prolong" instead of increase

Ask him if he has really tried any or all of these articles after shaving

Go right along - on high gear.

He evidently knows shaving comfort insurance as well as life insurance. No burn after a Colgate shave


Increase
Your Enjoyment of Shaving
Colgate's Talc Powder
After shaving—wash the face and dry thoroughly. Sprinkle the Talc Powder on the towel or on the palm of the hand and rub over the face.
or Colgate's Lilac Imperial Water
After shaving—wash the face; sprinkle a few drops of Lilac Imperial in the palm of the hand; pat the face gently and dry.
or Colgate's Charmis Cold Cream
After shaving—wash the face and thoroughly. With the ends of rub Charmis Cold Cream the skin. Wipe the face dry (some prefer water).

This circular inspired the above letter and our comments.
Colgate & Co., Est'd 1806, New York